

report of the

SECOND INSTITUTE on CLINICAL TEACHING

Edited by
HELEN HOFER GEE
and
CHARLES G. CHILD, III

Report of the
Seventh Teaching Institute
Association of American Medical Colleges
Chicago, Illinois, October 27-31, 1959

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REPORT OF THE
SECOND INSTITUTE ON CLINICAL TEACHING



Report of the Seventh Teaching Institute
Association of American Medical Colleges
Chicago, Illinois, October 27-31, 1959

Report of the
Second Institute on Clinical Teaching

Edited by HELEN HOFER GEE and CHARLES G. CHILD, III

With the assistance of the Planning Committee

Editorial coordination by E. Shepley Nourse

Office of the Director of Research
ASSOCIATION OF AMERICAN MEDICAL COLLEGES
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for the 1959 Teaching Institute**

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Preface

IN HIS presidential address to the Association of American Medical Colleges in the fall of 1952, Dr. George Packer Berry, Dean of the Harvard Medical school, set forth an imaginative and farsighted program of Teaching Institutes to be sponsored by the Association over the next six years. This volume is devoted to a report on the Second Institute on Clinical Teaching, seventh in the series originally envisaged. So in a sense this 1959 Institute represents the end of a cycle—though, it must be stressed, *not* the end of the Institutes, which are moving ahead with a somewhat different orientation for the next three years.

But at this point it seems appropriate to attempt an evaluation of the series just completed, trying to view them as whole, and as a new and highly successful departure in education. No one could deny that through the medium of the Institutes a great deal has happened in medical education, not only in this country but all over the world. One of the most gratifying of the dividends abroad, which can at least in part be claimed as a product of the Teaching Institutes, has been the launching of the Association for the Study of Medical Education in Great Britain (ASME). We in the United States are not alone in sensing that our efforts in medical education need an overhauling and that the urgency is very real.

Dr. Berry and the other members of a small but distinguished committee¹ of the Association set out with the blessings of the Executive Council to plan for a series of conferences on the teaching of medicine. These were designed with a broad purpose, to quote from Dr. Berry: "We are proposing, in short, that all of us examine critically the present structure of medical education and search for ways to make it more serviceable. Without minimizing any of the scientific aspects of medicine, we hope to find ways of enabling medical students to acquire a better understanding of the *total* patient in keeping with the mounting conviction that psychological and environmental factors are of consequence in health and disease. It is this plan, the attempt to restructure the teaching program to accommodate comprehensive medicine without diminishing 'scientific' medicine, that I call particularly to your attention."²

The striking success achieved by the Institutes can be attributed to a number of factors. One of these has been the clear need for them. Medical educators, and for that matter teachers in all branches of higher education, had long been accustomed to gathering at regional and national meetings to exchange information on research, but the opportunities for similar exchange vis-à-vis teaching were extremely limited. The tremendously fruitful development of new knowledge has itself created one of the most pressing forces demanding a re-examination of the aims, structure, and setting of teaching. It is axiomatic that research

¹ Membership of the Committee: George Packer Berry, Harvard, chairman; Stanley E. Dorst, Cincinnati; C. N. H. Long, Yale.

² "Medical Education in Transition," *J. Med. Educ.* 28, March 1953, p. 17.

and teaching are inextricably interwoven and must go forward together, and in balance, if higher education is to thrive. This balance has been distorted by many influences that have favored preferential attention to research. Among these have been better financial support, more rapid academic advancement, and more kudos for faculty members based on their research productivity. By providing a national forum directed to problems of teaching and of the student, much has been accomplished towards restoration of a proper balance.

Certain features of the organization of the Teaching Institutes deserve special mention as having contributed significantly to their success. They have been carefully planned well in advance by committees having wide representation of schools and academic disciplines. The staff of the Division of Basic Research of the Association, under the able and imaginative direction of Dr. Helen Hofer Gee, has gathered vast quantities of relevant and important data pertaining to the topics under discussion, so that the groups meeting at the Institutes have had plenty of information to work with, and it has been possible as never before to separate facts from opinions in consideration of a host of educational problems. As a result we have more information about medical students than has ever been mobilized about any group of students in a graduate discipline.

The participants in the Institutes have been selected by the planning committees with a view not only to representing the schools, but also to gathering in a group of manageable size faculty members of diverse interests and points of view, together with key individuals from disciplines outside of medicine and representatives from abroad, who have been able to bring a completely fresh critique. Participants in an Institute have without exception been truly involved in the work of the Institute. Activity has taken place largely in small groups of a dozen or so, in which it has been the rule to let the hair down and sail into the questions at hand with no charge to produce a "white paper" or set of answers, and with no one sitting on the sidelines as an observer. The emphasis has been on a free exchange of ideas and the encouragement of radical thinking. Participants have been provided with a setting conducive to cross-fertilization and they have time enough together to thaw initial reserve and to probe more than superficially into common interests. The sessions held over the martinis and old-fashionedes have been very important indeed.

It is easy for an academic discipline to grow up in relative isolation and to become more insulated with time as it becomes preoccupied with the ever-growing problems in its own immediate area. Medical schools in many instances have had but tenuous contacts with the rest of the university, to the detriment of both. In addition to the judicious mixing of clinicians of all sorts with representatives of the basic medical sciences and with deans of medical schools, the Institutes have brought in university presidents, engineers, economists, geneticists, anthropologists, philosophers, psychologists, sociologists, and "philanthropoids," with great effect on the breadth and depth of the deliberations. Above all, the intellectual level of the discussions has been high, with a minimum of lapses into the bogs of inconsequential detail. Participants have returned to their own schools with a broader appreciation of the relations of their own problems to the whole educational setting, and usually with some new friends, some new ideas, and in many cases with renewed hope of instituting some new approaches to solutions at home.

All in all, approximately 1,000 faculty members have taken part in the Teaching Institutes. Their influence on the faculties at home is difficult or impossible to measure, but there is little doubt that the combined impact has been cumulative and of considerable magnitude, the best evidence being the nearly universal involvement of medical faculties in the United States in a critical reappraisal of their curricula.

As was previously indicated, no attempt has been made to formulate resolutions nor to provide pat answers to the complex questions considered at the Institutes, for it becomes clear in every case that each school, by virtue of its setting and circumstances, has a somewhat different set of problems from every other school. There are common denominators, however, as well as areas of exceptional disparity from school to school. The reports of the Teaching Institutes, of which this volume is the seventh, have been published in order to bring as much as possible of the meat of the Institutes to a wider audience than the participants. It has been recognized that the reports cannot be all-inclusive, nor can they possibly convey the excitement or full flavor of the Institutes as they are generated on the spot. Nevertheless, the reports have done a remarkable job of capturing the essence of the meetings and of presenting the most important findings from the pre-Institute data collections. As such they have been major contributions to the literature of medical education, and their circulation has been wide both here and abroad.

Some of the more concrete results of the Institutes should be mentioned. First, they seem to have been biologically sound in that they have successfully reproduced. Reference is made here to the faculty "institutes" which have been held under one name or another (there are *not* enough names and they *all* sound hackneyed) in many individual medical schools. Such mechanisms seem to be almost essential elements in the final accomplishment of curricular change.

The Institute on pathology and related subjects, held in 1954, undoubtedly provided a major stimulus to the recognition of the place of genetics in medical schools. Until that time, not more than half a dozen schools had recognized this discipline in their curricula. By now only a handful are in the former category, as medical genetics has undergone a phenomenal growth in the intervening five years.

Similarly, a decade ago the role of the behavioral and social sciences in medical schools was minor and ill-defined. A recurrent theme running through all of the Institutes has been a concern with the proper place for these somewhat elusive but obviously important young disciplines in the medical school. Although it cannot be said now that these fields have been fully developed in any medical school, no one could doubt that much has been accomplished toward this end. Experimentation is under way in more and more schools; there is research in the behavioral sciences as such and consideration of their place in the teaching program as sciences basic to the understanding of psychiatry, and there is research related to student selection, student evaluation, and student achievement. The opportunities provided through the Teaching Institutes for mutual understanding between numerous behavioral scientists and many skeptics from medical faculties must have been responsible for much of the *entente cordiale* which is developing. The recognition of the importance of educational research and its implementation in an increasingly large number of schools, often in col-

laboration with the Division of Basic Research of the Association of American Medical Colleges, constitute an extremely important development that is strengthening both the individual schools and the Association.

A direct outgrowth of the Institutes of 1956 and 1957, on the Appraisal of Applicants to Medical Schools and the Ecology of the Medical Student, has been the focusing of national attention on the dwindling pool of well-qualified applicants for medicine. The mobilization of interest in the availability of scholarship and loan funds as well as in the dissemination of career information to high school and college students has been aided immeasurably by the data assembled by the Division of Basic Research of the Association and by the Continuing Group on Student Affairs. The latter has held national and regional meetings annually since 1956 and has operated most effectively to keep the stimulus of the Institutes of 1956 and 1957 alive. These two in the Institute series brought the focus back to the Student (he is capitalized here to emphasize his importance) at a very appropriate point in history. Most medical faculties had become accustomed to taking good students for granted and expected large numbers of superior candidates to continue knocking at the medical school door as they always had in the past, without realizing that many things were happening in the years after World War II to change the picture. These and other problems related to the medical student are now receiving intensive study, and machinery has been created for dealing with them cooperatively through the Continuing Group.

In short, the Teaching Institutes have gone a long way toward realizing a bold and constructive dream. As national faculty meetings—well planned, well run, and addressed to problems urgently demanding solutions—they have had an immense effect on medical education already and will continue to do so in many subtle ways for years to come. Furthermore, the implications for other areas of higher education must be clear; the lead taken by medical educators will doubtless be followed before long in many other fields. Credit cannot possibly be given here to all who deserve it. In addition to Dr. Berry and Dr. Gee, the Committee on Research and Education of the Association has been responsible for the ongoing supervision and coordination, and of course the members of the planning committees and subcommittees have contributed an unbelievable amount of time and thought. With very few exceptions the latter groups have profited so much from their participation that further thanks and recognition are redundant. Finally, recognition of the generous sponsorship by the Commonwealth Fund and the U.S. Public Health Service is in order. Their funds have made it possible to do the job well.

And now the reader is invited to the proceedings of the Second Institute on Clinical Teaching held in Chicago in 1959. Dr. Charles G. Child, III, an educationally oriented, medically minded professor of surgery was in the chair, and his discerning introduction follows immediately after the table of contents.

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*Dean, University of Virginia School of Medicine
President, Association of American Medical Colleges (1959-60)*

Table of Contents

<i>Preface</i>	vii
by Thomas H. Hunter	
<i>Introduction</i>	xix
by Charles G. Child, III	

Part I. Medical School Curricula: An Operation on Clinical Teaching

Chapter 1. <i>Some Preoperative Opinions</i>	3
A. <i>The Operation</i>	3
by J. Englebert Dunphy	
B. <i>The Paradoxical Plight of the Basic Sciences</i>	5
by Howard C. Taylor, Jr.	
C. <i>False Idols in Medical Education</i>	9
by Carroll B. Larson	
D. <i>Tribulations of an Anesthesiologist</i>	12
by Joseph F. Artusio, Jr.	
E. <i>The Teaching Potential of a Nonteaching Hospital</i>	17
by George C. Ham	
Chapter 2. <i>Some Postoperative Reactions</i>	23
A. <i>Postoperative Reactions of a Basic Scientist</i>	23
by Philip Handler	
B. <i>Postoperative Reactions of an Internist</i>	28
by Richard V. Ebert	
C. <i>A Final Word</i>	31
by J. Englebert Dunphy	
Chapter 3. <i>The Internship: Fact and Opinion</i>	34
A. <i>Some Characteristics of 1958-59 Interns and Internships</i>	34
by Helen Hofer Gee and Charles F. Schumacher	
B. <i>Factors Affecting the Choice of an Internship</i>	60
by Edwin B. Hutchins	
C. <i>Reanalysis of 1958 Institute Data Pertaining to the Internship</i>	68
by David Caplovitz	

Part II. The Roles of the University and Examining Boards in the Education of Medical Students, Interns, and Residents

Chapter 4. <i>Teaching and Learning Before the Internship</i>	85
by Eugene A. Stead, Jr.	
Chapter 5. <i>Postgraduate Schools and House-Officer Education</i>	89
by John G. Darley	
Chapter 6. <i>The Role of Examining Boards in Medical Education and in Qualification for Clinical Practice</i>	94
by John P. Hubbard	
Chapter 7. <i>Two Views of the Specialty Boards</i>	103
A. <i>A Surgeon's View</i>	103
by John H. Gibbon, Jr.	
B. <i>A Radiologist's View</i>	108
by Leo G. Rigler	

Part III. Science and Art in Teaching Responsibility for Patients

Chapter 8. <i>Knowledge, Conviction, and Ignorance</i>	117
by John D. Benjamin	
Chapter 9. <i>The Physician-Patient Relationship</i>	133
by Herbert S. Gaskill	
Chapter 10. <i>Teaching the Science and Art of Patient Responsibility: A Panel</i>	141
moderated by Albert J. Solnit	
Chapter 11. <i>Physician Opinion on Education and the Physician-Patient Relationship</i>	155
by Charles F. Schumacher and Helen Hofer Gee	

Part IV. A Symposium on Professional Education

Chapter 12. <i>Some Aspects of Professional Education</i>	167
by Moody E. Prior	
Chapter 13. <i>Physicians, Scientists, and Engineers</i>	174
by Lee A. DuBridge	

Appendixes

A. <i>Organization of the 1959 Institute</i>	183
B. <i>Roster of Participants</i>	186
C. <i>Background Information for Chapter 3 and Chapter 11</i>	193
1. Tests for Bias	193
2. Questionnaire for Interns	196
3. Questionnaire for Physicians	198

List of Tables

Part I. Medical School Curricula: An Operation on Clinical Teaching

TABLES IN CHAPTER 3, SECTION A

Table 3.1	Careers Planned by Interns at Different Levels of Ability	37
3.2	Types of Hospitals at Which Students at Different Levels of Ability Are Serving Their Internships	38
3.3	Career Plans of 1950 and 1958 Medical School Graduates	40
3.4	Number and Per Cent of Interns Planning One or More Years of Additional Study in Various Areas	40
3.5	MCAT Levels of Interns Planning Various Types of Careers	40
3.6	Type of Hospital Chosen by Interns Planning Various Types of Careers	41
3.7	Expenditure Levels of the Medical Schools Attended by Interns Planning Different Types of Careers	41
3.8	Type of Hospital at Which Various Internships Are Served	42
3.9	Evaluation of Major Clinical Clerkships	43
3.10	Average Ratings of Clinical Clerkships by Interns Serving Various Types of Internships	44
3.11	Intern Opinion on Balance Between Theory and Practice in His Clinical Clerkship	44
3.12	Balance Between Theory and Practice in Clerkship According to Type of Internship Served	45
3.13	Balance Between Theory and Practice in Clerkship According to Intern's Career Plans	45
3.14	Balance Between Theory and Practice in Clerkships of Interns From Different Types of Medical Schools Who Plan Various Careers	46
3.15	Value of Internship as an Educational Experience	47
3.16	Value of Internship According to Intern's MCAT Level	47
3.17	Value of Internship According to Type of Internship Served	48
3.18	Value of Internship According to Type of Internship Hospital	48
3.19	Value of Internship According to Intern's Career Plans and Type of Internship Hospital	49
3.20	Value of Internship According to Type of Internship Hospital and MCAT Level of Intern	49
3.21	Contributions of Internship to Intern's Professional Development	50
3.22	Contributions of Internship at Various Types of Hospitals to Intern's Professional Development	50

3.23 Contributions of Internship to Intern's Professional Development According to Type of Internship and Type of Hospital ..	51
3.24 Deficiencies in Internship	52
3.25 Deficiencies in Internship According to Type of Internship Served	53
3.26 Intern Opinion on Balance Between Theory and Practice in His Internship	54
3.27 Balance Between Theory and Practice in Internship According to Type of Internship Served	54
3.28 Balance Between Theory and Practice in Internship According to Intern's Career Plans	55
3.29 Balance Between Theory and Practice in Internships of Interns From Different Types of Medical Schools Who Plan Various Careers	56
3.30 Balance Between Theory and Practice in Internship According to Expenditure Level of Intern's Medical School and Teaching Affiliation of Hospital	57

TABLES IN CHAPTER 3, SECTION C

Table 3.31 Distribution of Faculty Members, Department Heads, and Recent Graduates According to Type of Internship Served ...	70
3.32 Type of Internship Served and Desired by Faculty Members and Department Heads	71
3.33 Type of Internship Desired by Faculty Members and Department Heads According to Type of Internship Served	71
3.34 Type of Internship Served and Desired According to Type of Appointment Held by Faculty Members	72
3.35 The Relationship Between Academic Rank and Type of Internship Served and Desired Presented Separately for Each Type of Appointment	73
3.36 The Relationship Between School Quality and Internship Served and Desired by Faculty Members Presented for Each Type of Appointment	74
3.37 The Relationship Between School Quality and Internship Served and Desired by Faculty Members	75
3.38 The Relationship Between School Quality and Internship Served and Desired by Department Heads	75
3.39 The Effect of School Quality on the Internships Served and Desired by Faculty Members and Department Heads	76
3.40 Type of Control of Medical School Attended as Related to Type of Internship Served	77

3.41 Type of Internship Served According to Region of Medical School Attended for Faculty Members Who Attended Private Schools Only	78
3.42 Reactions of Faculty Members and Department Heads to Proposal of Combining Internship and Medical School into a Four-Year Program	79
3.43 Willingness of Faculty Members and Department Heads to Participate in New Four-Year Program	79
3.44 Opinion of the Proposal According to the Type of Appointment of Faculty Members	80
3.45 Opinion of the Proposal According to the Quality of Schools at Which Faculty Members and Department Heads Are Located	80
3.46 Opinion of the Proposal According to Whether Faculty Members and Department Heads Have a Preference for a Rotating or Straight Internship	81
3.47 Opinion of the Proposal According to the Field of the Department Heads	81

Part II. The Roles of the University and Examining Boards in the Education of Medical Students, Interns, and Residents

TABLE IN CHAPTER 6

Table 6.1 Correlations between National Board Part II Scores and the Four-Year Cumulative Averages of School Grades from 16 Medical Schools	98
---	----

Part III. Science and Art in Teaching Responsibility for Patients

TABLES IN CHAPTER 11

Table 11.1 Age, Type of Career, and Specialty Board Certification of Physician Respondents	156
11.2 Ways in Which Physician-Patient Relationship Was Learned During and After Medical School	157
11.3 Methods by Which Physician-Patient Relationship Was Learned by Physicians in Various Types of Practice	157
11.4 Opportunities for Learning Physician-Patient Relationship During Various Training Periods	158
11.5 Opportunities for Learning Physician-Patient Relationship During Various Training Periods According to Age of Respondent	159

11.6 Opportunities for Learning Physician-Patient Relationship During Various Training Periods According to Physician's Type of Practice	159
11.7 Most Deficient Areas in Medical School Curriculum	160
11.8 Most Deficient Areas in Medical School Curriculum According to Physician's Type of Practice	160
11.9 Areas in Need of Greater Emphasis During Medical School ..	161
11.10 Areas in Need of Greater Emphasis During Medical School According to Physician's Type of Practice	162

Appendixes

TABLES IN APPENDIX C

Table C.1 MCAT Levels of Intern Respondents and Nonrespondents ..	193
C.2 Comparison of Intern Respondents and Nonrespondents on Teaching Affiliation of Hospital	193
C.3 Comparison of Intern Respondents and Nonrespondents on Expenditure Level of Medical School Attended	193
C.4 Ages of Physician Respondents and Nonrespondents	194
C.5 Present Practice of Physician Respondents and Nonrespondents	194
C.6 Specialty Board Certification of Physician Respondents and Nonrespondents	195



Introduction

CHAIRMANSHIP of a teaching institute of the Association of American Medical Colleges is a demanding and rewarding privilege. Active participation in the Institute itself is assured. Envious opportunities abound to share with the planning subcommittees the many critical speculations that inevitably precede one of these annual events, which for the past several years have contributed discerning thought to the rapidly changing scene of American medical education.

Pre-Institute thinking for 1959 ranged widely to capture a purpose and program for the Second Institute on Clinical Teaching (see Appendix A). To attempt to reflect this effort in a few paragraphs here is not appropriate. Prefatorially, however, I may invite identification of trends which I am sure will soon characterize clinical teaching in many of our more thoughtful medical schools. These trends are abundant in this report as well as in that of the first Institute on this important subject.¹

During the pre-Institute planning Dr. Dunphy and his subcommittee had barely defined a few matters important to clinical teaching when two curricular objectives clamored for recognition at this year's Institute. The first sought to introduce more science and scientific method into medical education and practice. The second ejected clinicians together with their sycophantic integration from the first two years of formal medical education. These objectives derived from Dr. Howard Taylor's paradox of "more and more basic science to teach and less and less time to teach it in" (see Chapter 1, section B). Dr. Taylor was, of course, particularly mindful of recent explosive developments in the sciences basic to medicine. These have appeared in the last 30 years and have provided many a problem to those responsible for introducing this body of new information into already overcrowded medical curricula. Genetics, radiobiology, biophysics, biometry, and even electronics are but a few of the many subjects demanding recognition as sciences fundamental to medical practice. Yet anatomy, physiology, biochemistry, and morphological pathology insist upon their traditional share of hours. From this paradox issued the objectives of our first-day discussions at the Institute. These revolved around a curriculum promising more science in clinical medicine and some methods for properly relocating clinical disciplines.

One way of achieving these objectives is detailed in Chapter 1 of this volume. Clearly the kind of support of science Dr. Dunphy's committee had in mind involved change. Not much change to be sure, for the Dunphy plan was con-

¹ Gee, Helen Hofer, and Richmond, Julius B. (eds.), *Report of the First Institute on Clinical Teaching* (Evanston, Illinois: Association of American Medical Colleges, 1959).

servative. Certainly the idea of change in behalf of more science and more scientific method in medicine was not new to institutes on clinical teaching, nor for that matter is the idea new to medical educators generally. At last year's Institute Dr. Dana Atchley placed science first in his paper entitled "The Science, the Art, and the Heart of Medicine," because he believed that "... scientific critique can be indoctrinated best, if not alone, in an academic environment; it is a rare individual who develops it subsequently as a practitioner."² Similarly, Dr. Carl Moyer emphasized that "Surely we all believe that the practice of medicine is best conducted as a science-based art as devoid of romanticism and empiricism as is humanly possible to make it."³ Nearly 100 years ago Philip H. Austin, M.D. and D.D.S., recognized the importance of begetting medical education in science when he wrote:⁴

A preparation begun in pure science may end in correct practice, and the early habits of student life may follow the professional man throughout his career; but a preparation, begun in practice will end there. The routine of professional duties often tempts the scholar to sink into the mere practitioner; it is rare indeed that one reverses the order of nature and sets aside the claims and emoluments of practice, to acquire slowly those habits of study so easily learned in youth. It requires the broadest literary and classical education of boyhood to counteract the necessarily narrowing influence of the professional studies of manhood; and it demands the largest possible infusion of purely scientific teaching, during professional pupilage, to correct the matter-of-fact influence of the practice. In this lies the great error of American practical systems of education. They teach boyhood to take a utilitarian view of every lesson learned, and encourage young men to neglect studies in which they cannot see some prospective pecuniary value.

To discourage clinical disciplines from usurping more and more time during medical school in the education of a physician, Dr. Dunphy and his Institute subcommittee emphasized that 30 years ago one-third of medical education was concerned with basic science, while today this period is perhaps less than a quarter. It was suggested that sciences basic to medicine be returned to their former relative and absolute relationships and that these could and should be taught for their own sake. Yet the changes envisaged by the Dunphy plan received scant support by Institute participants. In *Reflections from the 1959 Institute* Dr. Dunphy was forced to conclude that discussion "was unfavorable to the proposed changes."⁵ I too admit disappointment in the Institute's cool reaction to more of science and of scientific method in the curriculum. Must we conclude that American medical education is so bound by convention and so restricted by its past that it can neither experiment nor change? Must encyclopedic preoccupation with acquisition of medical facts persist and deep concern for method and discipline continue unexpressed?

The second day of our Institute echoed an emphasis of last year's Institute and introduced a new one. Last year Quigg Newton emphasized the university's role in providing proper clinical facilities for medical students. This year serious

² *Ibid.*, p. 18.

³ *Ibid.*, p. 10.

⁴ Quoted from Severinghaus, A. E., et al., *Preparation of Medical Education in the Liberal Arts College* (New York: McGraw-Hill, 1953), p. xvii.

⁵ A preliminary report prepared for Institute participants immediately following the Institute.

attention was given the university's responsibility for fostering education, and even scholarship, not only among medical students but among interns and residents as well. Today a good half of most physicians' medical education is acquired in hospitals. There seems little reason to doubt that this will soon apply to all physicians, not just to most. Since all agree that education flourishes in the environment of universities, Dr. Eugene A. Stead's subcommittee addressed themselves to this obvious but often sparsely recognized fact. In answer to a question from the floor inquiring whether engineering students become impatient by having only theory for a long time before they come into contact with practical problems, Lee DuBridge answered, "Of course they may very well [become impatient]. Now I think this is arranged for in engineering. . . . We are beginning to decide how it would be desirable to bring some introduction to engineering practices early in the course as a motivating influence. . . . In line with this we have been trying to persuade engineers to help give the courses—in physics, for example. I cannot say that this has been terribly successful."

The afternoon's program and discussion focused upon the role the various examining boards may play in molding medical education. Genuinely lofty ideas were expressed supporting an examining body through which achievement in this school or in that school could be measured. Certification as safe to practice surgery on the public mundanely sought recognition. But I could not avoid reflecting upon what my Dean might say if my experiments in surgical education were unique and my students regularly failed National, nay even State Boards. Similar expressions would surely appear were the rate of failure sizable among my American Board candidates. I sense that soon a few in medical education will appreciate that some of our failure to experiment may well be related to restrictions imposed upon us by our highly developed and enormously successful examining boards.

Education of physicians is a continuing process. Are universities too poor, too fainthearted, or too complacent and preoccupied to provide dynamic leadership in rehabilitating our worn-out and antiquated processes in medical education? Passing a multitude of examinations provides a curious sense of static achievement and of satisfaction with *status quo*. These somewhat less than laudable emotions were reflected vividly by Dr. George Packer Berry when he asked, "Why is the M.D. degree so often a barrier to further learning?" Are the vital concerns of medicine with continuing self-education really best served by idolatry of marks and examinations? By their very nature these provide sharply delineated cut-off points that too often emasculate incentive to further learning.

Both institutes on clinical teaching endorsed again and again that the principal objective of medical education is for the student to obtain a grasp of scientific method rather than any particular mass of factual knowledge. But what state, national, or American specialty board, may I ask, will concern itself with examining for grasp of scientific method and forego the sadistic pleasure of determining whether the precise anatomical relationship of the first portion of the duodenum or the formula for thyroxine is known to the student at hand? Trial by fire dies hard. Perhaps examinations for grasp of scientific method are not possible, but how will this ever be known until some real effort is expended in this direction? Who today is going forward with this problem of evaluation?

University trustees seem to avoid responsibility for care of patients and hospital boards shun concern for education. Resolution of this destructive dichotomy seems likely only when both kinds of governing bodies fully recognize the dual nature of their obligations. Is it too much to ask that universities accept responsibility for continuing house officer education in hospitals legitimately coming within their regional jurisdiction? How much longer will universities and hospitals delegate evaluation of achievement in medical education to central agencies and denominational examining boards? Are university trustees and regents really unprepared to assume final responsibility for hospital matters that are not only educational but also involve capacity to care for sick people?

After these and other educational peregrinations, the second day at the Institute left us with two significant acknowledgments. We have been producing practitioners for so long that we shall inevitably continue to do so. In this we take intellectual comfort from Dr. Stead's conviction that this we do pretty well. Through survey courses we have learned to provide men with smatterings of medical knowledge legally entitling them to the role of physicians, empirically and romantically practicing healing arts. We are proficient in graduating from our medical schools large groups every year, whose continuing education in medicine we happily turn over to drug houses. One might conjecture real accomplishments in postgraduate medical education if the sums spent annually in advertising by drug houses were available to postgraduate education in medicine.

Discussion did not stop with the practitioner. Gracelessly all of us acknowledged that we fail to educate in number medical scientists who will provide new knowledge in medicine and surgery. Seriously we asked ourselves whether we can indeed set our sights high enough to produce medical scientists purposefully, or whether we must be content, as we have in the past, to leave this fortunate phenomenon to chance. What the Institute didn't get around to discussing effectively was our growing conviction that medical scientists are better equipped to care for sick people than are romantic empiricists. How much longer can we afford to produce pill-pushing doctors rather than physicians scientifically oriented in the care of sick people? Are we really so committed to a dual standard that there is no road back to unity? During the Pre-Institute planning one subcommittee member even asked "After the general practitioner, what?"

The last day of the 1959 Institute continued a theme started last year—that of the physician-patient relationship. This year's planning subcommittee, led by Dr. Herbert S. Gaskill, found this particular attribute of medicine obvious though elusive. Clearly all medical education has for its ultimate goal the distribution of medical care to patients. How well or how poorly this is done relates in the first instance to the skill with which patients and physicians alike manage this critical interdependent relationship. Traditionally and vaguely this kind of professional association has invoked kindness, humaneness, and compassion. This year's Institute sought to examine the elusive nature of these obvious components of medical care. Troubles were had aplenty in planning and execution of the program for day three. Identification of something more than humanity in the physician-patient relationship was sought, and we even asked whether this can be taught effectively to students of medicine. We searched for a body of knowl-

edge of human behavior, particularly about behavior under stress of illness, that could be taught to medical students, interns, and residents. Eloquently, skillfully, and scientifically, Dr. Gaskill and Dr. John Benjamin pleaded for recognition of science and scientific method in understanding not only patient reactions to illness but also the psychological impact of patients and illness upon physicians.

Two comments, both issuing from the institutes on clinical teaching, are pertinent. The first is by Dr. Dana Atchley at the 1958 Institute: "As to the icy intellectual, I have said more than once, and have not been refuted, that no warm sympathetic person is frozen by research experience, nor is a cold tactless individual thawed by general practice."⁶

The second is from Dr. Helen Hofer Gee's paper entitled "Learning the Physician-Patient Relationship," based on a pre-Institute survey of the 1950 medical graduates:⁷

The fault lies not in a confusion of ultimate aims, but in a confusion of knowledge and beliefs with respect to what comprehensive care is, what can or cannot be taught, and who should teach. Which aspects of these problems are rooted in philosophy and which in science? To what degree is patient care a function of the physician's medical knowledge, of his attitudes, and of his basic personality structure? To what degree should it also be a function of a scientific knowledge of the psychology of human behavior and a function of his knowledge of sociology or of the development of skill in communication and in manipulating patients' emotions and attitudes? Humanitarian concern with the welfare of the patient has been thoroughly confused with knowledge of psychological and sociological components of organic disease processes, and both of these have been confused with how skill in dealing with the personal and emotional problems of patients may be developed.

As a subcommittee chairman in 1958 and as a chairman in 1959, let me look in retrospect at the two institutes on clinical teaching. Few would deny me this opportunity but how many will agree with me if I insist that medical education today is in transition from trade school to university? Slowly we learn that lectures which pack our curricula are cheap and support students in roles of dependent and passive recipients of their education. Seminars are replacing lectures—costly to be sure but invaluable in encouraging active and responsible participation of students in their own education. We appreciate more each day that students who have not accepted early responsibility for their own learning are unlikely later to reflect responsible attitudes toward patient care. The case system of teaching and learning is an enviable feature of American medical education. Its emphasis, however, is solidly shifting from demonstrative teaching by amazement to thoughtful study of the life history of disease and intimate participation in patient care. Here and there I see the shallowness of survey courses replaced by individual efforts in research as harbingers of depth in medical learning—fewer and fewer of today's facts but more and more of how to acquire and to use tomorrow's.

Curricula are relaxing as medical educators appreciate that no longer can the whole body of medical knowledge be taught or learned. Open curricula with

⁶ Gee, *op. cit.*, p. 19.

⁷ Gee, Helen Hofer, "Learning the Physician-Patient Relationship," *JAMA* 173, 1960, pp. 1301-4.

generous blocks of time for exploitation of intellectual curiosities and incentives are slowly and painfully making their appearance. I even believe I shall see the last of examinations held behind closed doors and chaperoned by honor systems or proctors. How much longer may we tamper so with the minds and morals of men and women who will so soon pass examinations daily in the presence only of their consciences and their educations? If examinations are held at all, they will probe for depth. Open books and leisure will be available for students to demonstrate capacity in scientific method and achievement. No longer will standards of excellence be judged by the rate and accuracy with which today's facts—too often tomorrow's myths—can be objectively regurgitated and electronically recorded. Fewer and fewer faculty members are busy practitioners scholastically emasculated by artisan preoccupations. More and more members of clinical faculties are full time scientists deeply concerned with clinical science in medical and surgical care of sick persons.

More and more the encyclopedic as a way of practice is, I believe, giving way to scholarship. Fewer and fewer will be the community hospitals where the "withered arm of science" is repetitively offered in patient care. In greater numbers will university-type hospitals emerge where science in patient care, teaching, and research are held in high regard.

For those who ask when this metamorphosis will be complete, I quote from Dr. Alan Gregg's Bampton lecture:⁸

... in the light of what I know about hospitals and human nature, the next time I am ill in a hospital I am going to go to a teaching hospital and ask (and, if strong enough at the time, insist) that I be used for teaching. . . . It is high time the general public understood the advantages of going to a teaching hospital, for being used for teaching invokes some additional attention given to diagnosis, treatment, and care, because all three are exposed to a far larger number of critics and questions in a teaching hospital than elsewhere.

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Professor of Surgery and Chairman of the Department

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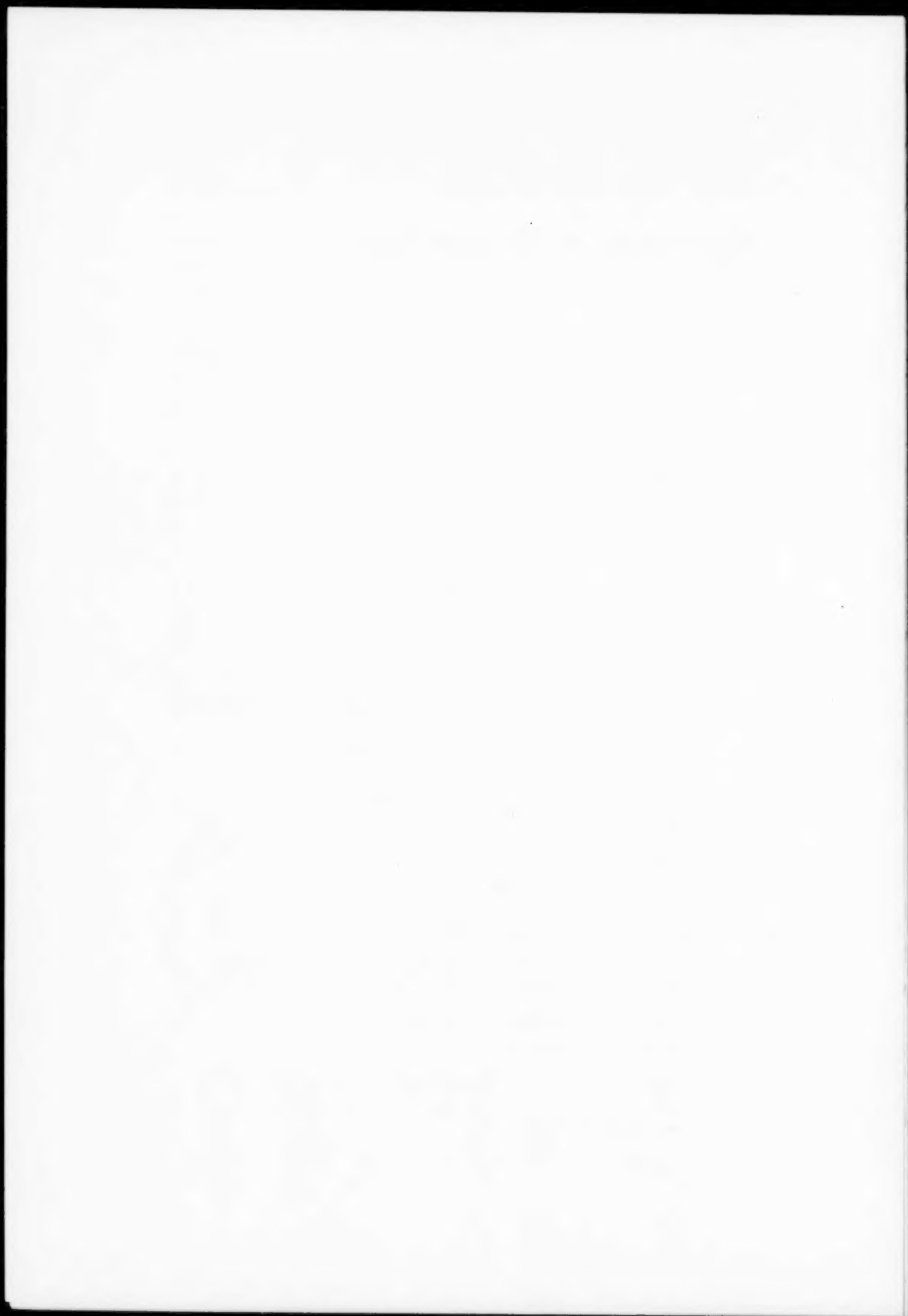
Chairman, 1959 AAMC Teaching Institute

⁸ Gregg, Alan, *Challenges to Contemporary Medicine* (New York: Columbia University Press, 1956), p. 55.

PART I

Medical School Curricula: An Operation on Clinical Teaching

	PAGE
Chapter 1. <i>Some Preoperative Opinions</i>	3
A. <i>The Operation</i>	3
by J. Englebert Dunphy	
B. <i>The Paradoxical Plight of the Basic Sciences</i>	5
by Howard C. Taylor, Jr.	
C. <i>False Idols in Medical Education</i>	9
by Carroll B. Larson	
D. <i>Tribulations of an Anesthesiologist</i>	12
by Joseph F. Artusio, Jr.	
E. <i>The Teaching Potential of a Nonteaching Hospital</i>	17
by George C. Ham	
Chapter 2. <i>Some Postoperative Reactions</i>	23
A. <i>Postoperative Reactions of a Basic Scientist</i>	23
by Philip Handler	
B. <i>Postoperative Reactions of an Internist</i>	28
by Richard V. Ebert	
C. <i>A Final Word</i>	31
by J. Englebert Dunphy	
Chapter 3. <i>The Internship: Fact and Opinion</i>	34
A. <i>Some Characteristics of 1958-59 Interns and Internships</i>	34
by Helen Hofer Gee and Charles F. Schumacher	
B. <i>Factors Affecting the Choice of an Internship</i>	60
by Edwin B. Hutchins	
C. <i>Reanalysis of 1958 Institute Data Pertaining to the Internship</i>	68
by David Caplovitz	



CHAPTER 1

Some Preoperative Opinions

A. The Operation

BY J. ENGLEBERT DUNPHY

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It is proposed that the first two years of medical school be kept as the particular province of the basic sciences. It is considered undesirable when clinical applications start before the scientific foundation is set; integration might better be accomplished by bringing the basic sciences into the clinical years.

SOME STUDENTS enter medicine with preconceived ideas of the role of a physician. This may be less than the ideal. Also there is a tendency on the part of medical students to regard preclinical subjects as little more than hurdles to be surmounted rather than as the foundation enabling the scientific method to become a part of the practice of medicine. The broadening intellectual influence of university life which should be a continuing force in the life of every doctor is often abruptly terminated on graduation from medical school. These circumstances, believed to exist at mid-century, prompted the Institute subcommittee for Topic I to consider operating upon the curriculum.

At one of our pre-Institute planning meetings, Dr. Howard C. Taylor, Jr., showed that the time devoted to medical education has been lengthened without a comparable increase in the period devoted to the sciences basic to medicine. He suggested increasing the time allotted to basic sciences as an antidote to what we believed to be some undesirable trends in medical education. Our subcommittee considered this idea of Dr. Taylor's and agreed that it was not necessary to increase the amount of time devoted to the basic sciences in order to restore the basic sciences to their previous position of prestige in medical education. A specific increase in time for any particular discipline is not necessary, nor should the student be loaded with more factual information. The proposed change in the curriculum would restore to the preclinical disciplines the time traditionally given to them and free them from the necessity of teaching with a strong clinical or "integrated" orientation.

As shown in the accompanying diagram (Figure 1), the first two years of medical school would be predominantly preclinical. The eggbeater, which represents clinical orientation, would not be introduced until the third year of medical school, where it would be used with the intention of bringing the science of medicine into the third and fourth years rather than clinical medicine into the first two years of the educational period.

It is the conviction of our subcommittee that this proposal is far from being

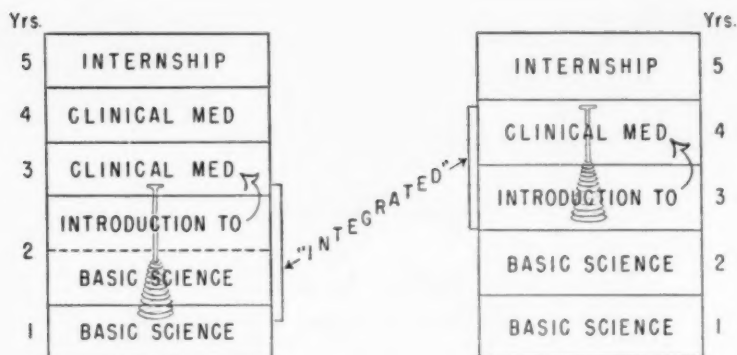


FIG. 1.—A diagrammatic view of the operation; the left column depicts the present curriculum, and the right one represents the proposed changes.

old-fashioned and retrogressive, for it enables a consistent deep and interference-free contact between teacher and student for the specific purpose of exploring an area of knowledge in depth and for its own sake. This is not the place to discuss the mechanics of accomplishing this objective or to define specific departmental areas. It is implicit in the observations that follow that the head of a department must have the prerogative of selecting the material to be taught in all cases, with the particular objective of emphasizing broad principles and the scientific method.

The first two years of medicine would not be static departmental presentations of knowledge, but rather dynamic explorations of fundamental disciplines. Anatomy must be concerned with cell growth and behavior as well as gross and microscopic morphology. The classification of tumors may fall in the realm of pathology, but current interest should focus on the growth potential of neoplasms, the behavior of tumors after transplantation, the natural history of tumors, and genetic and immunologic aspects of neoplasia. Exploration in depth can be so exciting that there should be no need for the student to see a patient with cancer of the cervix in order to be intrigued by the behavior of the Hela cell.

Presented with vision, imagination, originality, and the spirit of inquiry, the biological and chemical sciences offer the most fascinating area for exploration in their own right. How much or just what subject matter is covered is not nearly so important as how it is presented and how extensively the student is compelled to put personal effort into the learning process. The acquisition of knowledge can never be a happy passive process. Scholarship implies vigorous self-participation and the burning of midnight oil. The joy of learning rests with accomplishment. One cannot write a book by dreaming with a pencil in one's hand. One cannot become a physician without learning anatomy. Even the most sharply focused nonorthopedic specialist should know there are two bones in the lower leg and one bone in the thigh.

Giving medical students a rigorous two years in the basic preclinical sciences, an experience broad in scope and full of various explorations in depth, requires

that some bridge be built between this education and the application of such knowledge in the practice of medicine. It is our belief that this should take place in the third year and would require a concerted and organized effort on the part of both the preclinical and clinical faculties. Here is where the clinician with a firm grasp of the scientific method as well as the art of medicine is essential. Many men with this background are developing today. Their teaching efforts should be focused on the construction of the bridge between the preclinical and the clinical years. This is where "integrated teaching and organology" should appear. A mature student already well grounded in the preclinical disciplines and with a firm grasp of the scientific method will develop very rapidly into a clinician with a grasp of the philosophy of science.

All would agree that a dichotomy exists between the clinical and preclinical years. The problem is how to bridge this gap. When one brings the clinician and "integrated teaching" into the first two years of medical education, it inevitably takes time and prerogatives away from the basic sciences. Under these circumstances the chairman of the department of biochemistry, who should be building the foundation of tomorrow's medicine, cannot teach his disciplines as he wishes. He must adjust his program to fit the integrated approach. He must teach today's medicine primarily. The proposal of our Institute subcommittee would bridge the gap but still allow the basic sciences the same autonomy and freedom they have enjoyed in the past.

If medical progress is to continue, the basic sciences should be five years ahead of the practicing clinician. Any attempt to narrow this gap should focus on making the clinician run faster. This means bringing science into the clinical years. When one brings clinical medicine into the basic science years, it tends to narrow the gap—but by slowing down the pursuit of knowledge in the fundamental disciplines pertinent to medicine.

B. The Paradoxical Plight of the Basic Sciences

BY HOWARD C. TAYLOR, JR.

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Over the last quarter-century, trends in the education of the physician have been toward increasing the amount of time devoted to the acquisition of practical skills by introducing students to clinical medicine early in their medical educational career and by greatly increasing the length of residency programs. This trend may be regarded in a sense as paradoxical, since the real revolution of the last 25 years has been the increase in the body of basic scientific knowledge. Suggestions are made with respect to ways in which more time could be found for the education of the physician in scientific fundamentals—a move that seems called for in view of our increasingly scientific world.

I SHOULD BEGIN by describing at once what I think we mean by "The Paradoxical Plight of the Basic Sciences." This rather happy phraseology, of which I wish I were the author, was intended to emphasize this point: that in our time, when science is the basis of so many of the concepts we employ and is itself expanding so rapidly, medical curricula are, paradoxically, most generous with the time they assign to the development of clinical skills.

For the purposes of this discussion there may be said to be three components in a medical education, each necessary to the development of the complete physician.

1. *Scientific fundamentals* including mathematics, chemistry, physics, and biology. These provide the symbols with which the physician thinks as well as the tools with which he may carry on research.
2. *Clinical skills* which include a knowledge of the manifestations of disease, surgical dexterity, and an ability to handle an increasingly quantitative therapeutics.
3. *A humanitarian orientation*, an important but intangible objective of medical education. Considerable thought has been given it by medical educators, and its supposed disappearance from the physician's outlook has recently been the object of criticism in widely circulated periodicals. The humanitarian outlook of the physician seems to be related, somewhat confusedly, in people's minds to a liberal arts education in the humanities, to the social aspects of medical care, and to the remembered image of the family doctor of an older generation.

These aspects are surely complementary in the makeup of the perfect physician, but they are also in competition for the hours of the medical student's attention. In the presence of an increasingly science-oriented world it is important to consider how these aspects of medical education have fared over the last 25 years.

IMBALANCE IN THE CURRICULAR NETWORK

Basic sciences

First of all, there has been no clear increase in formal science course requirements for entrance into medical school. Mathematics, preferably with elementary calculus, general biology, general physics, and quantitative, qualitative, and organic chemistry are the prerequisites now as they were a quarter of a century ago. The content in these courses has, of course, been modernized, but the number of hours devoted to them has not been substantially increased.

In the medical school curriculum, the total hours devoted to the basic sciences also remain the same, although there may have been some change in the relative time devoted to each. Indeed, in some schools there has been an incursion by the clinical departments into the first two years with the avowed purpose—certainly a desirable one—of focusing the student's attention on the human problem and of firing his interest by beginning his clinical contacts early. Yet, is it possible to register simultaneous gains both in the theoretical and applied fields simply by what we worshipfully term integration, or is something lost in the process from the essential disciplines of the basic sciences?

A point of partial compensation must be noted in the increased tendency to interpret clinical phenomena in scientific terms during the years when the student is under the supervision of the clinical departments. Certainly in many institutions the student's working knowledge of chemistry, physiology, and pathology increases during the clinical years, but in others the process of forgetting scientific fundamentals probably begins at the end of the second year and then continues during the years of clinical clerkship and internship.

Clinical skills

In contrast to the intangible gains in the basic sciences, the increase in clinical experience required before practice is undertaken is apparent.

Clinical clerkships have seized upon one year of the undergraduate curriculum and in some institutions almost two years. Internships have become universal. Residencies, under the urging of the specialty boards, have increased in length and now last from two to five and even six years. The young American physician, perhaps especially the qualified surgical specialist, begins his career more skilled in the execution of his clinical duties than has ever before been true in this country or probably elsewhere in the world.

Humanitarian attitudes

With the American physician's humanitarian aims—his "sense of compassion" as one lay periodical has recently termed it—there has recently been some concern. Remedies have been sought by introducing instruction in psychology and sociology into the medical curriculum, and by arranging for earlier contact with patients, particularly in their home environments.

One can certainly ask, however, whether the simple introduction of these patient contacts, perhaps two years earlier than formerly, will produce a significant difference in the doctor's future attitudes. Indeed, should the experiences that will eventually come to every practicing physician be introduced at a time when they cannot fail but take hours from the basic sciences to which few students can ever return?

It appears, then, that a vast increase in opportunities for clinical experience has been organized for the physician in the last quarter-century, and further, that a lively—if often sentimental—interest exists in maintaining his social and human orientation. Yet, in an age characterized primarily by science-dominated concepts, no extra time is being given to developing the fundamental scientific background of the future physician. This brings us again to the justification for the title of this presentation, as it appears in the Institute program: "The Paradoxical Plight of the Basic Sciences."

METHODS OF REINSTATING THE BASIC MEDICAL SCIENCES

Assuming the preceding analysis of the problem is correct, next we must consider what might be done to solve it. Additional basic science education might be assured by adding a year to the medical school curriculum in the same way that year after year has been added to the clinical residency. This step would

have the obvious disadvantage of prolonging almost *ad absurdum* the total number of years spent in education. Yet, this plan is in fact already anticipated, and the increasing number of postresidency research fellowships and training grants attest that additional laboratory experience is needed, at least by those entering academic medicine. It appears, then, that for those few who are to be medical scientists in the clinical fields, a major deficiency in basic science education is already recognized and an attempt is being made to remedy it.

A second method of improving the scientific knowledge of the physician might be to increase the prerequisites for admission to medical schools. This may indeed be the ultimate solution, but until pressures now being exerted by graduate schools upon undergraduate colleges are passed back to the secondary schools, it will be difficult to increase entrance requirements greatly, unless hours spent in college on the so-called "humanities" are sacrificed.

The third method that requires consideration is the possibility of expanding basic science teaching within the sacred four years of the medical undergraduate curriculum itself. At first this appears impossible, but further thought suggests that such a change might be relatively easily effected as Dr. Dunphy has indicated (see Section A).

The emphasis on teaching in the third and fourth years has recently been toward the development of clinical clerkships in which more and more participation in patient care is accorded the undergraduate. At the same time efforts have been made to improve the internship by increasing supervision and by a degree of systematization of instruction. The result has been that these years—clerkship and internship—have become so similar that a question arises as to whether both are really necessary.

No attack on this unnecessary redundancy seems to be coming from the basic scientists. In many institutions, however, the internship is being inconspicuously absorbed into the residency system, while maintaining its original classification by the use of the designation "straight internship." This reorganization is justifiable on the grounds that after a series of highly organized clerkships, the rotating internship seems superfluous. However, the question may be raised as to whether this year, if it is saved, should be devoted to clinical training.

Considering the vast increase in scientific knowledge and the certainty that medicine must develop and be practiced on a scientific basis, it seems proper to consider an increase in hours assignable to scientific subjects in the medical curriculum. These hours would become available if it were recognized that the modern clerkship and well-organized internship are in fact nearly identical and may be combined into a single year.

The proposed changes in the organization of the medical education appear feasible and consistent with the trends and advances outlined earlier. Several possible advantages are apparent. The increased weight to be given the medical sciences in the theory and practice of medicine would be the first and perhaps greatest advantage. The medical sciences have sometimes come to be regarded as simply preliminary to, if not subordinate to, the clinical branches. They are, however, disciplines in their own right which have broader functions and perspectives than are involved in providing a background of elementary knowledge to future practitioners of medicine. An expansion of their time in the undergraduate

curriculum would reinforce their prestige and increase their stake in the creation of the physician.

A second advantage to be expected from a combination of the clerkship with the internship would be the revitalizing of the latter. Since this year would become an essential one, it would precipitate a reform in internship organization that should result in higher standards in many hospitals.

Finally, the physician himself would benefit by being made more competent to deal with the new applications in science that will constantly be made available to him during the years of his practice. That medicine will become increasingly scientific in its application seems safely predictable and the physician, if he is to be more than a technician, must be increasingly well prepared to understand and cope with a medicine based more and more upon science.

The principal objective of modern medical education should aim not only at preparing the young physician to do his present work, but also at providing him with the kind of background that will enable him to assimilate the scientific advances that may be anticipated during the 30 or more years of his future practice.

If these points be true, should not the clinical teaching in the undergraduate curriculum be somewhat reduced in time to give an opportunity for expansion in the basic sciences?

C. False Idols in Medical Education

BY CARROLL B. LARSON

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The "typical" medical applicant is described, but the diversity is emphasized, and a question is raised concerning school-by-school specialization in preparation for different medical careers. The situation is complicated by evidence that student career idols may change during the medical school. Can or should a medical school provide encouragement for future teachers and researchers when community demands in the service area remain high?

AS FAR AS I know, I am the only orthopedic surgeon present at the Institute, so if by chance I pull your leg, I will at least be able to avoid professional criticism. My assigned subject is entitled "False Idols in Medical Education," and this is where the leg-pulling comes in, for it is actually a little false as a title. Impressions are frequently false but, as the ancient Greek philosophers noted, men and nations do not act upon facts or truth. They act upon what they believe are facts and truth, and that is often quite another thing. Our purpose at this Institute is to discuss medical education with the hope that we might recognize and eliminate some of the false idols or implications where they exist.

The medical student

The quality of the product of any system of medical education—whether it be in the United States, England, or Russia—depends in large part on the raw material that goes into it. It has often been said that a good student, taught by a good faculty in a good educational setting, cannot help but become a good physician. Such generalization has little meaning or truth unless we can specify a good student, a good faculty, and a proper setting.

The entering medical student in each school is the best available from the applicant list. The best available at Harvard may be, and probably is, somewhat different from the best available at the State University of Iowa. Perhaps we should take a closer look at what we know in general about entering medical students in the medical colleges across the country.

Accepted applicants to medical schools have a median score of 131 on intelligence tests of the general college aptitude variety;¹ four-fifths are four-year college graduates, 80 per cent majored in science, about two-thirds had B averages in college and one-third were divided about equally between A and C average students;² 12 per cent are the sons and daughters of physicians.³

We can describe them further: 8,030 minus 79 are Americans;⁴ 95 per cent are male; one-half of the students' parents had college educations. More than one-third of the students are employed part-time. Forty per cent are married, and of these, more than one-half have children.⁵

The average medical student has strong drives toward achievement and exhibits less cynicism and anxiety than law students. By the end of the medical curriculum, however, the anxiety remains about the same and the cynicism tends to increase when compared with the law students.

From tests of personality traits, many medical students can be described as deferent and respectful variations of the stereotypical, well-socialized, middle-class male. They are less outgoing than engineering students, but far from withdrawn as are teacher trainees. The career choice in medicine is often a spontaneous attraction motivated by expectancies as to security, self-expression, and/or prestige.

To many, the idol of "the doctor" was provided by early contact experiences, by personal medical challenges, or by organized educational effort. In cases where the career choice was deliberate selection, it was usually made on the basis of family tradition or strong identification with another individual through opportunity or encouragement; at times it was the result of early personal handicaps. We know further—in spite of these qualifications, including the IQ levels and

¹ Gee, Helen Hofer, "Differential Characteristics of Student Bodies: Implications for the Study of Medical Education," in *Selection and Educational Differentiation* (Berkeley, California: Field Service Center and Center for the Study of Higher Education, University of California, 1960), pp. 125-54.

² "Medical Education in the United States and Canada," *JAMA* 168, 1958, pp. 1459-547.

³ Gee, Helen Hofer, and Glaser, Robert J. (eds.), *The Ecology of the Medical Student* (Evanston, Illinois: Association of American Medical Colleges, 1958).

⁴ *Op. cit.*, *JAMA*.

⁵ *Op. cit.*, Gee and Glaser.

the motivations—that 10 per cent of the medical students across the nation fail to complete the medical curriculum.

At this point, it is of interest to note that of medical students educated in private schools, 62 per cent attend privately-endowed medical schools. In a similar pattern, 67 per cent of the medical students who attend state schools received earlier education through public school instruction.⁶ There is a general impression that private school graduates are more achievement oriented, although I have found no evidence to support or reject the assumption.

Specialization by school

We might explore this impression a bit further by asking a question. Can a medical school change the student's preconceived idea of his goal, which has been shaped by the demands of the community in which he grew up? For instance, should the State University of Iowa College of Medicine produce primarily general practitioners, as it is thought to do, and leave the production of professors to the Harvard Medical School?

By legislative mandate, the medical school at the State University of Iowa is endowed with tax funds to provide physicians for the state. Keep in mind that 85 per cent of the students are state residents; most have been educated in public schools or small denominational colleges and most have lived in smaller towns or on farms in the midst of a service-oriented culture. The image of the physician to most is exemplified by the family doctor who has community respect, is hard working, and drives a Cadillac. Facetiously, or perhaps not facetiously, this last is added to emphasize that the practitioner is oriented toward social mobility and work, and consequently enjoys high economic and prestige status. It would be anticipated that most of the Iowa students would follow their image into general practice but the facts do not substantiate this.⁷

Among the graduates of the medical college from 1930 to 1934 inclusive, 50 per cent are in general practice and 30 per cent in various specialties, while 9 per cent are engaged in teaching and/or research, and the remainder are scattered in public health, army and navy medical corps, and industrial medicine.

A similar survey of the class of 1950 shows a drop-off to 38.5 per cent in general practice and a rise to 55.7 per cent in specialties, with the remainder entering public health and so forth. Furthermore, of the 55 per cent in various specialties, a number are engaged in teaching and research to the equivalent of 9 per cent of the total class, and thus this figure has remained exactly the same as it was in the 1930-34 period.

Could it be that while engaged in the medical school curriculum the idol's face changed from family doctor to specialist as a reflection of the teacher image, or might one consider that humanitarianism lost out to stronger socio-economic urges?

One might infer that over a long period approximately 9 per cent of all students entering the College of Medicine at the State University of Iowa have

⁶ Sampey, J. R. "Collegiate Training of Doctors of Medicine," *J. Med. Educ.* 34, 1959, p. 601.

⁷ From a personal survey conducted by the author of the classes of 1933 and 1950, State University of Iowa College of Medicine (unpublished).

been achievement oriented, with the remainder of students fitting more generally into the service orientation. The rise in specialty practice would appear to be a change in goal without a change in basic orientation.

This brings up a pertinent question: Can or should the curriculum and faculty of a medical college be modified to change the student's orientation? Obviously, this would be desirable if more teachers and research workers are to come from a state school such as Iowa. On the other hand, a preponderant number of doctors are still necessary to meet community demands in the service area. Should the State University of Iowa, therefore, continue to provide physicians for service?

Should the State University of Iowa College of Medicine maintain a curriculum and faculty with such flexibility and versatility that, over a period of time, it would challenge an increasing number of academic aspirants, at the same time raising the scholarship standards in the service areas? Or, should the curriculum be geared to the production of general practitioners, allowing the 9 per cent of achievement-oriented applicants to be directed into schools whose curricula are better suited to match their needs, goals, and abilities?

A final concern in recent years is the decreased number of applicants to medical schools in this country. It seems unlikely that the challenge in medicine has changed in this short time. It must be that the attitude of the potential applicants who did not apply has changed, for more are entering careers in chemistry, English, and mathematics.

The reasons for this are not apparent, but if the trend continues it will be necessary to seek out false idols that dampen the career choices in medicine, and this concern will become the responsibility of medical educators.

D. Tribulations of an Anesthesiologist

BY JOSEPH F. ARTUSIO, JR.

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Actual administration of anesthetic agents to patients should be reserved for the postgraduate student. However, the undergraduate medical student should be instructed in the management of the comatose patient and the handling of the airway; he should be given some insight into the inherent dangers of the anesthetic state and the importance of thorough training for administration of these pharmacological tools.

Because of lack of time in the curriculum for the minor specialties of medicine, teachers of such specialties must conduct what amounts to a popularity contest in order to interest a student and perhaps eventually influence him to devote his life's work to one of these specialties.

Students entered in all graduate residency training programs are in need of a program that begins with simple concepts and simple techniques. These

students require a complete review of the basic sciences pertaining to the clinical specialty before complicated concepts and techniques can be added on this framework. This need for repetition of basic science material may be related to methods of teaching basic science at the undergraduate level.

Specialty teaching and the undergraduate student

AS SPECIALIZATION in American medicine has increased, teachers of the various specialties have felt the need for an opportunity to teach their subjects at the undergraduate level of medical education, even though the specialty itself may represent a very small fraction of medical knowledge and its practitioners may require many years of study and experience before they become competent in all phases of the discipline. In the undergraduate teaching time available, it is impossible to present more than a brief introduction to a specialty. Thus, such instruction can be of little practical value to the recent medical graduate.

It was once quite common for the fourth-year medical student to spend one or two weeks in the operating room so that he might become familiar with the administration of anesthetic agents. This clinical teaching was confined for the most part to the administration of diethyl ether by the open-drop technique. The brief introduction to anesthesia was designed to enable him to administer an anesthetic agent if he found himself in a situation where he was the only physician present. Such a smattering of knowledge frequently gave the student a false sense of security, which in turn did not reduce unnecessary deaths from anesthesia for emergency medical procedures. In spite of the dangers of a "little knowledge," it was feasible to teach the medical student the open-drop technique using diethyl ether because the anesthetist of that era had a limited armamentarium.

A vast number of rather precise anesthetic techniques have been developed over the past 25 years, however, so that now it is impossible to give the fourth-year medical student even the small amount of training that would suffice for him to use modern agents and techniques intelligently and safely. Associated with this advance in techniques is the increasing complexity of surgical procedures performed on patients of every conceivable risk from the newborn to the nonagenarian.

Indeed, the field of anesthesiology has become to all intents and purposes a truly postgraduate discipline. The anesthetic agents should not be administered by individuals who use them only occasionally. It takes great courage for even a highly trained individual to render another human being unconscious, remove his protective reflexes for many hours, and maintain the state of complete reversibility of systems affected by the anesthesia and surgery.

I believe that the modern-day practice of anesthesiology should be presented to the undergraduate medical student by didactic lectures and seminars. He should be instructed in management of the comatose patient and handling of the airway, and he should be given some insight into the inherent dangers of the anesthetic state and the important role of the well-trained individual in administering the pharmacologic tools that produce that state. As a teacher, I want to meet the medical student personally and teach him some fundamental principles of respiratory and circulatory resuscitation that may save his patients' lives. I want to instill in him an appreciation of good anesthetic management. I want him

to learn how the modern anesthesiologist functions in an operating room and as a consultant to all departments of a hospital.

There is another and more selfish motive, however, in wanting to reach the student almost from the day he enters the medical school. Like all other specialists, the anesthesiologist is interested in attracting the best of the medical students to his discipline. He wants to advance his specialty; he wants to see individuals of high caliber and good training spread throughout the world. Thus, he wants to lead the student toward real insight into modern anesthesiology.

Prospective graduates frequently seek the advice of older physicians on desirable ways to practice the healing arts. Often they are told that in the old days anesthesia was relegated to a technician or to the lowest ranking physician on the staff—and the surgical patient did pretty well. They are told that the administration of anesthetics is hardly as satisfactory a fulfillment of medical practice as some other specialty might be. The same story is told not only about anesthesiology, but also about many other areas of medicine that are downgraded by the unknowing. The picture thus presented is not attractive to the new student. He needs a goal toward which he may strive. He needs a type of practice he can consider worthy of his life's work.

Professors of the major departments of the medical school do not have this problem. Internal medicine, surgery, pediatrics, and obstetrics and gynecology have reached maturity as medical specialties, and many hours are devoted to them in the medical curriculum. The student is introduced to these major specialties over a long period of time and very early in his medical education. He is impressed by the knowledge of a young internist, fascinated by the skill of the surgeon, and frequently overwhelmed at what can be done to save life in the practice of obstetrics and gynecology. The professor of a minor specialty department on the other hand is accorded little time and therefore must make a real effort to get to know the student and to encourage the student to know him and the specialty.

The professors of the many so-called specialty branches of medicine are only too happy to assist as lecturers in basic science courses. It is true they want to help teach the student and are anxious to impart their knowledge. However, in this early contact the specialist also wants to impress upon the student the fact that he is a clinical practitioner who is so expert in some particular basic science that the professor of the preclinical department has invited him to participate in his course. The initial meeting may produce a long-lasting impression, sowing seeds of interest that may eventually attract the student to the clinician's field. Hence, the professor of a specialty will call upon his best personnel to participate in the courses taught during the impressionable first and second years of medical school.

How does the specialist attract the young student to his specialty during the clinical years? This is a time when the budding doctor is beginning to consider career alternatives most seriously. Frequently his final decision is based upon an acquaintance or an association with a very vital physician whom he has come to admire. Upon this friendship he molds his future course in medicine.

It is important, therefore, that the clinical teacher present his specialty, and especially its basic fundamentals, in a rather dynamic fashion. The professor

must not neglect the dramatic; he must point out how vital and important the specialty is in saving lives and increasing longevity. He must direct attention to possible careers in the fields of teaching and research as well as in clinical practice. He must introduce still unsolved problems and invite solutions from the students and he must attempt to introduce them to his own research and to show them the entire scope of his field. He must point out how his particular specialty offers the young physician real and readily available opportunities to help human beings.

I do not wish to depreciate the importance of the specialist's role in imparting fundamental knowledge of a particular field so that the medical student may be provided with a well-rounded background. However, as every specialist realizes, the amount of material that can be presented to the medical student in the short period of his medical education is extremely small. But, the attempt to get to know the student, and, in turn, to get him to know the particular specialty and what it encompasses, I term the "popularity contest" in specialty teaching. The committee for Topic I has proposed a plan to minimize this popularity contest by automatically bringing the clinical specialist to the student in a very definite and integrated way during his medical training (see Chapter I, Section A).

Basic sciences and the postgraduate student

Now let us have a look at the product our medical schools have produced by examining the student who presents himself for training as a resident or fellow. At this time the postgraduate student will probably have had one year of internship plus his medical school training. As director of a residency training program in a specialty, there appear to me to be two distinct groups of postgraduate students. An individual from the first group can really be treated as a graduate student. Having been placed in the proper setting and given the proper tools, he will go on in a period of years through a process of self-education to become very proficient in the skills of his specialty and to become a well-rounded physician in all aspects of patient care. He becomes well-versed in the past and current literature. He will have reviewed the basic sciences related to the specialty and most probably will have begun to contribute to advancement of its knowledge in a small way, perhaps with a piece of basic or clinical research. This individual needs only guidance, and his teacher can give him a philosophy on which he may base his knowledge and his practice. He is a great comfort to his teacher and makes academic life worth while. But, such a gem is rare indeed.

From my observation of a small segment of the product of our medical schools, most postgraduate students are not of this type. The vast majority of physicians in residency training programs cannot be taught their chosen specialty according to these idealistic principles of self-education. I have often asked myself, "Why is this true?"

I have wondered whether the vast majority of postgraduate students are lazy, whether they lack the mental capacity to grasp the specialty, or whether some part of our medical school training is at fault. I have not answered these questions to my own satisfaction. However, I have sought solutions to correct existing deficiencies.

We cannot assume that simply because a young person has earned a medical

degree he has the fundamental foundation of knowledge upon which well-rounded specialty training must be constructed. One cannot talk about the critical closing pressure of a peripheral vessel when the basic facts about the general hemodynamics of the circulation have never been learned or have been forgotten. Therefore, I have adopted a method to build the foundation almost from the bottom. I have found it necessary, for example, to review respiratory and circulatory physiology from its very rudiments, and then to apply particular aspects of this knowledge to the practice of anesthesiology.

I believe, as others do, that this is not done most effectively by didactic lecture. It is done preferably by seminar discussion groups where the postgraduate student prepares the material prior to the meeting and the instructor rounds out the discussion, placing emphasis on various aspects that are most important to the specialty. This must be done in a stepwise fashion, starting from the very simplest basic ideas and gradually building up to the more complex theories.

One wonders whether the student has ever been taught his basic science material. Was it the fault of his teachers, or has it been his own fault? Is the information presented during the medical school experience acquired by rote and then forgotten, or is the basic science teacher concentrating on a particular phase of the subject related to his own individual field of research? Was the over-all subject neglected? Did the physiology department teach him everything about circulatory physiology because that was their primary field of interest, and teach him practically nothing about respiratory physiology? Was his basic science material ever related to a clinical situation? Were these basic science facts ever demonstrated in a specific disease entity? Perhaps he forgets the fundamentals which were taught to him because he had nothing with which to associate them.

I do not know the answers to these questions. Nor do I know why the postgraduate student lacks the initiative to read. He seems often to be lost when it comes to the simple mechanics of obtaining the necessary material for learning. He cannot be left on his own initiative to learn, because if he is, he will not emerge as a credit to a good residency training program.

It is unfortunate that one cannot introduce the postgraduate student to the various journals that are related to the specialty—and suggest that he read them. But one cannot do this because the student so often lacks appreciation of which articles are important and which are not. He is unable to assess the competence of the investigator; he has no knowledge of the background that eventually produced a particular paper. Usually, if an entire journal is given to a beginning postgraduate student and he is told to pick out an article on which he would like to report—and one he feels is a significant contribution to the literature—one will find that he picks an article that is most probably not worth the paper it is printed on. He needs guidance at a very early period in his training so that he may develop an appreciation of the literature and how to read it.

As our residency training programs are presently constituted, the student must learn to perform his clinical duties and must also prepare his basic fundamental didactic material within a short space of 24 hours each day, and of course he must sleep and eat as well. If he has not developed a plan of study during his medical school career and has not brought his fundamental knowledge to his residency training program, he finds this an almost overwhelming task.

It is a rather simple matter to make the postgraduate student a technician, but to make him a well-rounded physician-specialist is an entirely different matter. Our Institute subcommittee, led by Dr. J. Englebert Dunphy, has developed a plan that may decrease the need for the almost complete review of basic science material that most postgraduate students seem to need. Perhaps it will relieve the burden of the clinical teacher and allow him to foster the development of scholarship in his postgraduate students—and to encourage self-education—rather than having to devote time to establishing the foundation before proceeding to train the man.

E. The Teaching Potential of a Nonteaching Hospital

BY GEORGE C. HAM

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The customary classification of hospital affiliation or nonaffiliation with medical schools for teaching purposes is not functionally valid. Furthermore, many "nonteaching" hospitals contain patient material of a specialized or chronic nature not normally found in "teaching" hospitals; such material could be of great value in the teaching programs of medical schools. Nonteaching hospitals often look on the medical school training programs as a source of service potential, intellectual stimulation, and prestige. Two partners of a potential symbiotic relationship are thus present. How such a relationship was made possible between the department of psychiatry of a state university and several nonteaching hospitals in that state is described here. The symbiosis was accomplished "despite separate administrative control, despite initially quite differing goals, and despite separate budgets and the problem of distance." Problems that arose were settled through administrative arbitration with due regard to the needs of both partners.

DISCUSSION of the teaching potential of a nonteaching hospital requires certain definitions, assumptions, and generalizations. As indicated in Chapter 3, Section A, the AMA Council on Medical Education and Hospitals classifies hospitals according to the type of teaching affiliation they maintain with one or more medical schools. Three categories exist: (1) major teaching hospital, (2) minor teaching hospital, and (3) nonaffiliated hospital.

This classification, although useful, is not necessarily closely related to the quality of the educational program. At one extreme there are major teaching hospitals with less than optimal programs, and at the other pole nonaffiliated hospitals with programs of high quality. For purposes of this discussion we will begin with hospitals which are outside these categories and have no organized teaching program whatsoever. I hope to indicate that what applies to the educational potential of these so-called nonteaching hospitals can apply to hospitals of any category.

THE NONTEACHING HOSPITAL

Nonteaching hospitals vary widely in terms of size, organization, and function. Some are general hospitals in which are represented many of the special areas in medicine and others may be specialty hospitals dealing with only one branch of medicine. Some may be privately owned, others community operated, and many are operated by the state or federal government. A tremendous variety of organizations and purposes makes it impossible to discuss the widely differing assets and liabilities except in terms of general principles.

A reprint of a paper by Dr. Julius H. Comroe, Jr., entitled "Advanced Training for Specialty Practice" was included among the preparatory materials for the 1959 Teaching Institute.¹ Dr. Comroe has very succinctly defined many of the problems related to continued graduate education in medicine. He shows clearly that discontinuity in educational programs between medical school curricula and those educational programs developed for interns and more advanced students seeking specialty training is very great. The conflict of service orientation with educational orientation is emphasized. There is no need to repeat the points made by Dr. Comroe except to emphasize that his thesis is applicable to almost all teaching and nonteaching hospitals no matter what their affiliation.

It is my thesis that many nonteaching, nonaffiliated hospitals have important potential educational assets. Potentially any or all of such nonteaching hospitals can add to the educational opportunities of medical students, interns, and those seeking specialty training. Whether this problem is looked at from the standpoint of the medical school and its educational needs for medical students and interns or whether it is looked at from the standpoint of specialty training, there can be no doubt that maximum utilization of available opportunities is not occurring. Should medical school curricula be revised in some such manner as suggested by Dr. J. Englebert Dunphy, the role of the internship in the education of the physician would be revitalized, and the urgency of improved medical school-nonteaching hospital relationships would become even greater than it is now.

Many medical schools would like to extend their educational programs into nonteaching hospitals to broaden the experience for their students and, as Comroe points out, to extend curriculum planning into the intern and specialty training years. Conversely, many nonteaching hospitals approved for specialty training would like to have the prestige, recruitment value, research interests, and educational benefits that can result from associations with medical school faculties. In addition, as Comroe has shown, we find the clinical experience and curriculum of medical students in some so-called major teaching hospitals molded and somewhat controlled by the requirements of specialty boards and committees certifying the particular specialty within the teaching hospital. Lastly, we find graduate training for specialties in nonteaching hospitals that bears little or no relationship to the ongoing educational needs of either medical students, interns, or residents.

Reaction to this state of affairs is clearly indicated in the data compiled as background for this Teaching Institute (see Chapter 3). Existing "affiliations"

¹ *Medicine: A Lifelong Study* (London: The World Medical Association, 1961).

or lack of them is not solving our dilemma. This poses an important and serious challenge to American medical education. We are not fully utilizing or organizing our potential for education, and both the educators and hospitals are frustrated. What potentially could be a healthy flourishing symbiosis is suffering from marasmus.

A CASE HISTORY

I should like to present an example of a situation that has gone a long way toward solving some of these difficulties. Some of the requirements of successful development will be discussed. I am alluding directly to the inclusion of previously *nonteaching*, *nonaffiliated* hospitals into an organized educational program for medical students and specialists as part of the responsibility of a medical school department, the dean of the medical school, and the parent university.

Needs and resources

In late 1951 with the reorganization from a two-year to a four-year medical school at the University of North Carolina, plans were initiated for the development of a department of psychiatry for education of medical students and graduates seeking specialty training. Although special facilities were planned to include a 54-bed inpatient unit and a clinic capable of handling upwards of 20,000 outpatient visits per year, it became clear that additional educational opportunities were essential.

It was apparent that a broad and adequate educational experience would require case material representing the whole spectrum of biologic, psychologic, and social illnesses subsumed under psychiatry. The list of clinical syndromes that would be inadequately represented at the main teaching hospital connected with the medical school was long. It included chronic and acute psychotic illnesses in their manifold forms and in large numbers, epileptics, committed alcoholics, problems of senility, "criminally insane," sexual deviants of all types, psychotic children, mental defectives, the blind, first offenders, and many neurological disorders in all racial groups. An additional requirement was the opportunity for intensive and continuing experience with highly specialized therapeutic techniques, particularly in the area of drug therapy and various physical treatments. Also, certain research interests would require large groups of patients who would be available for adequate periods of time. All of the above were considered essential to complement the university teaching hospital in the development of an adequate educational program.

At that time there existed five separate installations in the state where most of the above requirements in terms of patient material could be met. One of these had approval for two years' specialty training in psychiatry; the others had neither nationally approved training accreditation nor programs. (The number of these installations has now risen to seven by the addition of two new hospitals for mental defectives.) These installations were entirely supported by the state and controlled by a lay board appointed by the governor. Professional direction consisted of a general medical superintendent with the superintendents of each institution responsible to him. These professional medical positions were

matched by similar independent and autonomous business officers. All of the institutions and their leadership were primarily service-oriented by definition.

In early discussions it became apparent that officials of the state institutions saw potential benefit accruing to them through the development of a psychiatric teaching unit at the university. This focused almost entirely around the need to recruit personnel into the state, to "train" them for service in state institutions. One candidate for symbiotic pairing had become evident. The other was already evident in the needs described above for an adequate educational program in the medical school and the teaching hospital. Continued discussions ranged widely regarding various mechanisms to satisfy the different but potentially symbiotic needs. Probably almost every form of relationship that now exists between different medical organizations in this country was considered. Suggestions ranged from no affiliation at all, through invitations to visit back and forth informally with students at various levels, to assignment of students and residents to one or the other institution at which "teaching" would be the responsibility of the staff of the given institution. These can be described as varying forms of minor affiliation.

None of these methods was felt to be acceptable to the curriculum planners. Instead, efforts were directed at means to obtain the essential and particular nutritive elements peculiar to each of the two organisms seeking symbiotic gratification. Since the medical school had defined its need in terms of broadening and continuing of opportunities for all levels of students, one criterion could be established, and it was agreed that any nonteaching institutions would be used by the teaching center for educational purposes only. It was also agreed that the educational program of medical students and advanced students in other disciplines (e.g., psychology, social work, nursing, social science) would be the responsibility of the appropriate faculty members of the medical school or the university. Thus, continuing education or extended education would be planned and coordinated as part of the regular education.

It is at a point like this in the attempt to negotiate mutual symbiotic needs that various alimentary disturbances can arise. The natural and specific anxieties and resistances of the second party arise with respect to "being used," interference with authority, interference with organizational patterns, as well as many other familiar phrases. Clarification of such differences requires evidence that the requirements of one partner, although initially anxiety-producing, may yield benefits to the second party.

Gradually it became apparent to the nonteaching units in the state system that medical students and other graduate specialists would not be recruited to the nonteaching hospitals unless the stimulation of active educational and research programs was added as a permanent fixture to the existing heavy service demands. With the clear realization of educational and research program need on the part of the nonteaching hospitals, and the necessity to recruit and hold highly trained people from the local medical center as well as from other medical centers, motivation for the development of a symbiotic relationship was increased. Planning was implemented immediately and in 1952 was labeled "Operation Bootstrap."

Ground rules for symbiosis

First, it was understood that all educational programs for medical students and for those seeking specialty training in adult psychiatry, child psychiatry, or any of the allied fields would be the responsibility of the faculty of the medical school—whether these educational facilities were in the medical school, the university, the hospital, or in the institutions of the state system.

Second, the faculty of the medical school would consist of those appointed and paid directly by the medical school on a full-time basis, plus any members of the staff of the various institutions who were qualified to receive clinical faculty appointments in the medical school. These clinical appointments would be based on the usual criteria of training, experience, and quality. Such appointments would require a minimum participation of one full day per week in teaching, research, seminars, and patient-care activities at the medical school center, as well as additional teaching and research supervision of students and/or graduate trainees while assigned to their particular state institution as part of the educational program.

New additions to the staff of any institution could be recommended and reviewed for faculty appointments with the same stipulations described above. These part-time clinical members of the faculty would be responsible to the undergraduate and postgraduate education committees of the Department of Psychiatry in regard to curriculum, pedagogical techniques, and reports in exactly the same manner as full-time members of the faculty at the university medical center. Beginning with two appointments in 1953, this clinical faculty increased by 1959 to twenty members, with each existing installation of the state hospital system represented.

Third, it was agreed that *full-time* members of the faculty at the medical center would visit and participate actively in the educational programs assigned to any one of the state institutions one full day per week. The visiting full-time faculty member, with the assistance of the part-time or clinical faculty members at that institution, would negotiate with the responsible authorities of the institution toward the implementation of the educational program of the medical student or trainee and would be responsible for its conduct. Six different full-time faculty members are now visiting six different institutions for a minimum of a six months' period.

Fourth, it was agreed that there would be no interference with the administrative operation of the organization in any manner except that related to the educational program as negotiated with the authorities. Conflicts that might develop would be negotiated by the superintendent of the organization through the general superintendent and with the chairman of the department at the university and other necessary officials.

Fifth, it was understood that the visiting full-time faculty member would, when time permitted, conduct in-service education programs for the hospital itself, not necessarily related to the basic university curriculum. Similar understandings were reached with regard to development and conduct of research, would could be either university sponsored and directed or vice versa.

Sixth, it was agreed that as soon as possible residents in psychiatry would spend a minimum of six months out of their three-year program in one of the

state institutions as a means of introducing the wished-for educational and research stimulus to the institutions. In 1952 no residents were available to send to any hospitals. In 1953 two residents were sent to one state hospital for several months. This year (1959) twelve residents are working in five of the seven state institutions for six-month periods of time. Educational programs as an integral part of the medical student curriculum began in several of these institutions in 1952 and have expanded steadily to the present.

Although the administrative identity of each of the separate institutions and the medical school has been maintained, this identity for educational and research purposes loses significance. The previously nonteaching hospitals have become active and responsible parts of the medical school curriculum plan and are participating as equal partners with regular faculty appointments and responsibility. The various institutions have extended their own research and educational programs beyond those planned by the university, particularly for their own inservice benefits. Operation Bootstrap of 1952 has gradually become successful symbiosis.

It will be recalled that the state institutions' nutritional need was seen in the area of recruitment of physicians and other personnel, and that it seemed apparent that educational and research programs were essential to this end. Recruitment of all types of personnel, both from the university center and from out of the state, has greatly improved.

Further details are unnecessary here. Suffice it to say that there has been dyspepsia from time to time on one side or the other of the symbiotic relationship. Each time, however, careful evaluation of the essential nutritional elements with attention to the masticatory aspects of the process allowed return to relative equilibrium.

It is important to point out that previously designated nonteaching hospitals have become active parts of a university-organized educational program despite separate administrative control, despite initially quite differing responsibilities and goals, and despite separate budgets and the problem of distance. I would like to mention that one state hospital is 177 miles from the university center, another 105 miles, a third 78 miles, and two additional ones at 30 miles and 26 miles respectively. Arrangements for facilities, travel, and other geographical aspects have been worked out because of the mutual motivation toward need satisfaction of the two parties involved.

This program has become more than a major affiliation. It is a program in continuing medical education from the first year in medical school to the most advanced level of education, all developed and implemented by a medical school faculty. It makes relatively meaningless such affiliation terms as major, minor, or none. It meets many of Comroe's specifications regarding educational planning. The same principles of symbiotic association can be applied to any medical school-hospital educational program.

This particular situation has been presented in this manner to indicate that tremendous benefits can accrue to both parties and, more importantly, to the potentials for medical education in all branches of medicine through the establishment of balanced symbiotic relationships. The teaching potential of nonteaching hospitals can be great.

CHAPTER 2

Some Postoperative Reactions

A. Postoperative Reactions of a Basic Scientist

BY PHILIP HANDLER

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The basic science education of the medical student is hampered, not only by the incursion of clinical teaching, but by inadequacies in existing basic medical science curricula. Lagging pathology departments, for example, no longer satisfy the need for synthesis. Further, clinical teachers who fail to stress relevant basic functions render previous learning ineffectual.

Rather than expand the time allotted to existing basic medical sciences, new courses in cytology, biophysics, genetics, and other sciences should be added to the curriculum. It is proposed that a program in the third year can provide an opportunity for intensive study and investigation, an experience in depth. Duke's experimental program offers such an opportunity to medical students.

A FEW WEEKS before this Institute I received a tentative program which stated that I would provide the "Postoperative Reactions of a Basic Scientist." However, I was not informed of the nature of the operation in question and I arrived wondering whether biochemistry was to be excised from the curriculum and hoping that perhaps anatomy was to be transected. However, it appears that the basic sciences are to be placed in traction! The remarks that follow represent my initial reaction to the scheme Dr. J. Englebert Dunphy has proposed (see Chapter 1, Section A).

As I understand the proposal, it centers about an article of faith to which most of us subscribe—that progress in medicine depends on the findings of those who work in the basic health-related sciences. Hence, since the task of the medical school is to prepare the neophyte physician for medical practice in the world of tomorrow, it is imperative that he be well informed with respect to knowledge currently available in the preclinical sciences, and that he be equipped to assimilate future developments. The practitioner of medicine or any of its specialties will not only progress through the clinical years of the medical curriculum and extensive postgraduate specialty training, but will pass the remainder of his professional life in continuous clinical self-education.

It is, therefore, not too much to ask that during his years in medical school adequate time be set aside for thorough preparation in the preclinical sciences. Dr. Dunphy and his committee decry the incursion into this available time by the clinical faculty with the result that while the body of basic scientific knowledge related to medicine has been increasing rapidly, the time available for its expo-

sition to the medical student has been decreasing. With this I find myself in complete agreement.

Current curricular and teaching problems

But there are several facets of this problem that have not been exposed. First let me note that the culprits do not all come from clinical departments. Many of us have been greatly concerned with the fact that pathology has lost its place as queen of the medical sciences. Far too many of our pathologists have remained wed to the light microscope and the crude histochemistry of classical pathological techniques. Too many of them, overburdened with service responsibilities, have failed to keep pace with exciting developments in biochemistry, genetics, cytology, and cell physiology—to say nothing of physiology and pathological physiology as it is understood by the clinician. The personal dilemma of the pathologist who is unsure whether he is a clinical or preclinical scientist has been reflected in the inadequacies of many of our courses in pathology. Because of this, pathology has all too frequently neglected its opportunity to serve as the truly synthesizing element of the first portion of the medical curriculum. The result is that this role has gone by default to clinical faculty who teach courses such as An Introduction to Medicine in the second or even first year of the curriculum. Many of us eagerly await a renaissance in experimental pathology which cannot help but have a profound effect on the manner in which pathology is presented to the medical student.

Next let me point out that if the graduating medical student about to enter his residency training period seems inadequately informed in the basic sciences, the fault does not lie wholly at the door either of the preclinical faculty or the structure of the curriculum. If the clinical implications of modern physiology, biochemistry, and other sciences have not been stressed by our clinical colleagues on the faculty during the second portion of the curriculum, then the time spent in the preclinical departments will very largely have been wasted. It is not long since our students entered upon their clinical studies thinking of serum sodium, for example, in milliequivalents per liter, only to find their clinical professors talking about sodium chloride in milligrams per cent. That time, fortunately, is behind us but we still have a long way to go.

In this regard let me take this opportunity to state my own position with respect to integrated curricula. It seems absurd to me to expect to produce an *integrated* student from the teaching efforts of a *nonintegrated* faculty. The most serious single defect in the structure of our medical schools is the lack of means for keeping alive the scientific education of our all-too-busy and harried clinical faculty. Clinical journals and drug house representatives, as well as the formal teaching mechanisms of the medical school, serve admirably to keep them *au courant* with advances in clinical practice, but we have failed to find a proper mechanism whereby we might also keep them abreast of recent significant development in the basic health sciences.

At this point I want to address a remark to deans of medical schools generally. It has become fashionable among deans to decry the growth of research in our medical institutions. It is stated that the scale on which research is presently conducted has detracted from the supply of both practitioners and medical

teachers and thus has done injury both to American medical education and practice. Although I have not seen tangible evidence in support of this thesis, even were it true, it should be recognized that the growth of research in our medical schools has meant that many young physicians—who otherwise would never have substantially increased their own backgrounds in one or another of the basic scientific disciplines—have by virtue of their research interests substantially extended their own knowledge of biochemistry, physiology, microbiology, epidemiology, biometry, and genetics.

It is the teacher-investigators on our medical faculties who will translate the findings of the basic scientists into clinical teaching and practice. Even if their research, *per se*, yields no other fruit, this would be sufficient return to our educational institutions for the cost and effort of our expanded research programs. This will be all the more apparent when, one day, our medical schools assume formal responsibility for the postgraduate medical education that occurs in university-affiliated hospitals.

Expanding the basic medical science curriculum

I have been wondering what my preclinical colleagues would suggest that we do with the extra time in the curriculum provided by Dr. Dunphy's proposal. With each of the preclinical departments in most medical schools pleading for more time, the simplest notion would be to prorate the increment here offered among the existing preclinical departments. But I submit that this would be a profitless course to follow. In all likelihood, it would be extremely difficult for the preclinical faculties of different institutions to agree on what they would consider the hard core of the preclinical curriculum, the central body of information to which all students should be exposed as a minimum.

Nevertheless, I do believe such agreement could be reached within any institution. I further believe that this body of information can be presented in the time currently available to the major preclinical departments. In most institutions the current structure of the curriculum permits the preclinical faculty to provide for their students a reasonable appreciation, if not understanding, of the principles, philosophy, and approach to biological problems that characterize these disciplines. Certainly, the details cannot be mastered in the allotted time, but such mastery is unnecessary. All that can be done or need be done is for the student to acquire the minimal body of information while also gaining an appreciation of how, for example, a biochemist thinks about the problems of biology and what the tools are that a biochemist can bring to bear on these problems. There is no need in such a core curriculum to go beyond this level of sophistication, and indeed little more could be achieved if the time for the exposition of biochemistry, for example, were doubled in the usual medical curriculum.

Although the conventional preclinical sciences are, or could be, adequately represented in the curriculum, a number of other disciplines have come to assume increasing significance on the medical scene, in the years since the present curriculum was established. In the near future these disciplines must be admitted into the medical curriculum in some manner. These include modern cytology and the union of biochemical function and cell structure made possible by electron micros-

copy, biophysics (whatever this term may mean, and it is highly variable from biophysicist to biophysicist), and genetics. These represent some of the most exciting adventures in biology in the period since World War II, and there can be little doubt of their impact on medical practice in the years to come. Radiobiology, strictly speaking, is not a discipline but rather should be encompassed in a modern treatment of pathology; its principles should be appreciated before an introduction to clinical radiology. If adequate time were made available, each of these various areas of learning might be incorporated into the preclinical curriculum in conjunction with one or another of the more conventional preclinical sciences.

A generation ago, psychiatry was admitted to the medical curriculum as a full-fledged partner of the other clinical disciplines. In many medical schools a beginning has been made at providing, in the preclinical years, an appropriate introduction to the study of psychiatry, an introduction that includes psychology, some sociology, and "psychobiology." If we may construe the conventional preclinical studies as the scientific preface to clinical medicine, then it would appear logical that there should also be provision for the necessary underpinning to an adequate approach to psychiatry later in the curriculum. No biochemist would venture to state the nature or extent of such an introduction, but if the time were made available, I have complete confidence that our colleagues in the behavioral sciences could provide the necessary blueprint.

The Duke experiment

The foregoing remarks are largely self-evident and few in my audience are likely to take exception. But there is a different course I should like to propose, a course that would require not merely that clinicians withdraw from the first two years of the curriculum, but that an alternative course of action be considered for the additional year before the student enters his clinical studies (see Figure 1, Chapter 1, Section A). What I am about to propose is predicated on the concept that the study of medicine, as all other graduate education, should be conducted as a pursuit of excellence. In the confines of the present curriculum, the student samples in cafeteria fashion the offerings of each of the preclinical departments—and in the foregoing I have proposed even more such offerings. I now submit that, before going on to his clinical studies, it would appear wise for the student to have had at least one experience in depth, one opportunity to grasp something more than the superficial treatment our "core curriculum" can make possible. One approach would be for the student to return to a preclinical department, or even a university department, of his choice and there spend a year in which he immerses himself in that discipline. During this time he would take additional formal courses at the graduate level, participate in frequent seminars, and undertake a modest research problem. This is by no means a novel proposal. It is in fact a program that is now being followed by selected students, on a voluntary basis, in most of our medical schools. And I have yet to meet a medical student or house officer who has regretted availing himself of such an opportunity. It leaves a mark that stamps itself indelibly on his future and provides him with a firm platform, a point of view with which to look at the problems of biology and clinical medicine.

There is, however, an additional approach to what might be done with such a year inserted into the middle of the medical curriculum, an approach we have lately undertaken at Duke University School of Medicine. Just as it is healthy, and indeed vital, that there be investigators on the medical faculty—since these investigators are better clinicians and teachers for being investigators—so too I believe that the flavor, life, and effectiveness of a medical school will invariably be strengthened if there be in progress an experiment in medical education at the medical school. I should like, therefore, to describe briefly the experiment that has been initiated in our institution. Please understand in advance, however, that it is an experiment. If this experiment proves to be profitable and fruitful, we will accept its lessons and make appropriate changes in our basic curriculum. If the experiment is unsuccessful, we shall discard it and try another.

In brief, each year we divert into a special program a group of about 12 medical students who have finished the second year and about six fellows who interrupt residency programs in the various clinical services. This group lives together for a period approximately equivalent to one academic year. In the mornings they receive didactic instruction in areas that are seriously lacking in their previous training. These include mathematics, statistics and statistical theory, electronics and instrumentation, logic and the scientific method, and a history of experimental biology. The remainder of the program, its didactic and seminar work and laboratory experiments, is devoted to what has in recent times come to be called "cell biology." Within our framework this term encompasses cytology, genetics, intermediary metabolism, enzymology, tissue culture, cell physiology, and biophysics.

To implement this we have created a new laboratory with generous facilities for the group of 18 students. Its equipment includes a least one of each of the major pieces of apparatus necessary to the scientific specialties mentioned above. Thus, there is an electron microscope and its necessary appurtenances, a fully equipped tissue culture laboratory, radioisotope equipment, ultracentrifuges, Warburg apparatuses, spectrophotometers, x-ray tube, incubators, and cold rooms, to mention a few. In the laboratory, with these facilities, the students repeat a set of classic experiments that require use of each of the tools and techniques for which the laboratory was designed. But each student proceeds at his own pace and never goes on to the next experiment until he is satisfied with the results of the previous one and has developed confidence in his ability to use the techniques. This phase of the program requires 14 to 16 weeks. Thereafter, each student undertakes a small but feasible research project, again in the general area of cell biology. He chooses as his mentor any member of the medical school or the university faculty to whom he has become attracted and may then pursue his research either in the personal laboratory of his mentor or in the general student laboratory that is available to him for this purpose.

It is too soon to evaluate the success of this program, now in its first year. It is clear, however, that an experiment such as this also assays the strength not only of the medical school but of the university. We have drawn into the program professors from all over the university: the engineering school, the departments of physics, chemistry, mathematics, and biology, as well as our medical faculty. Thus, the program also provides a device that strengthens the ties of the medical

school to the university, and I hope that you will agree that this is a healthy phenomenon.

The particular "curriculum" of the year described above is by no means the only such program feasible or desirable. It was fashioned out of our desire to expose our students in depth to the area of greatest ferment in modern biology. This seemed particularly advisable since, as these students proceed through their clinical years of medical school and thereafter, they will have constant contact with teacher-investigators who are excellent physiologists, pharmacologists, and the like, i.e., scientists concerned with the whole animal or whole man. This is perhaps the student's last opportunity to focus on the life and times of a single cell, and the entire program is devoted to this concept. But, it will be apparent that one could readily fashion an independent curriculum in which a student would devote himself for a year to pathological physiology or the general subject of behavior. These possibilities will be obvious and it is to be hoped that at Duke, as elsewhere, such programs will come into being in the near future.

Please understand that, in one year, this program cannot produce knowledgeable, sophisticated scientists, but we are certain that these students should be far better off than their predecessors have been as they enter the clinical phase of the medical curriculum. Furthermore they can look forward to a lifelong continued self-education in several areas of science basic to medicine. We sincerely hope that many of them will later accept postdoctoral fellowships and embark seriously on a career of research and teaching. It is from this group that we hope to find faculty for our medical schools in the future. Nevertheless, all of us at Duke are confident that this experience will not be wasted on those students who, having tasted research and education in depth in some of the basic health sciences, decide to continue in general or specialty practice. They will have gained a point of view and a sharpened ability to ask questions and to read critically. It is another article of faith that these are the attributes of the good physician.

B. Postoperative Reactions of an Internist

BY RICHARD V. EBERT

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Brief questions are posed and answered with the aim of stimulating additional reactions. What is meant by science? Is there a clinical science? Should one-half of the clinical work of the student be taken in a hospital not under direct control of the university? The answers lie not in *what*, but *how*.

THE EMPHASIS in the preceding Institute presentations has been on the need for increasing the teaching of science as opposed to instruction in practical technique. Dr. J. Englebert Dunphy suggested an alteration in the curriculum that would permit additional teaching of the basic sciences. Obviously this pro-

posal is offered to stimulate discussion and thought rather than as a call to immediate action. Instead of discussing this proposal in detail I will ask several questions. I will give my own answers to the questions, but I hope I will stimulate others to give their personal answers.

Questions and answers

What is meant by science? One must differentiate between the body of knowledge that has been accumulated by the use of the scientific method and the scientific method itself. One cannot hope to teach the student the entire body of knowledge encompassed by scientific medicine. One can hope to teach him something of the methods of science.

Can the categories of science be ranked in terms of inherent value? There is a tendency to rank branches of science in terms of prestige. Thus clinical science is ranked below biochemistry and biochemistry is ranked below physics. This type of ranking would not appear to be particularly helpful in planning the curriculum of a medical school.

Is there a clinical science? I believe that the methods of science can be applied directly to the study of disease. Many problems in medicine can only be solved by carefully planned experiments involving sick human beings.

Can the methods of science be taught and illustrated on the wards as well as in the laboratory? I believe that the student can learn much about the methods of science in studying his patients. In a sense each patient presents a problem in science: evidence must be gathered and evaluated; a hypothesis must be created as to the nature of the illness; and means must be devised for testing this hypothesis.

Is there an advantage in using patients in teaching? There are two. The student is strongly motivated because of his primary interest in clinical medicine, and he is able to participate actively in the teaching process. Much of the gathering of evidence and thinking must be done by the student himself.

Is the formal lecture or demonstration a good method of developing the ability to use the methods of science? I believe the answer is no, but the lecture may be an effective method of transmitting to the student a body of knowledge.

Is the learning of technical skills science? I do not believe the instruction of the student in technical skills such as physical diagnosis or the method of performing lumbar puncture, bronchoscopy, or other procedures can be considered science. This does not, however, lessen their importance to the practicing physician. A quotation from Flexner may be pertinent at this point.¹

If medicine accepts as its goal—however remote that goal may be—scientific standards alike in research and in practice, medical education must be conceived as primarily the effort to train students in the intellectual technique of inductive science. For the analysis, however, of the simplest situation which the ailing body presents, considerable knowledge is required; for practical ministration, still another volume of knowledge and experience is requisite. The facts in question cannot be passively learned and mechanically applied. On the contrary, an extraordinarily active and oft-repeated mental process, involving observation, sorting out, combining, infer-

¹ Flexner, A. *Medical Education: A Comparative Study* (New York: Macmillan, 1925), p. 13.

ring, trying, must be in constant operation in both the diagnosis and the treatment of disease. The teacher of medicine cannot, therefore, achieve his object by himself culling and arranging for the student the particular bits of information which are likely to be of practical utility; nor can the period of study be so prolonged as to enable the student to master any considerable part of the knowledge or technique already in existence.

During the discussion on the first day of the Institute it was suggested that the internship year duplicates the work of the clinical clerkship, and it was suggested that this year be incorporated into the medical school curriculum. This raises several additional questions.

Does the internship duplicate the medical clerkship? The pre-Institute survey of interns gives information on this point. Twenty per cent of the interns questioned thought that there was a significant duplication. Apparently the great majority felt that this was not true. Seventy-two per cent of the interns stated that the internship was of much value. (See Chapter 3, Tables 3.15 and 3.24.)

Should one-half of the clinical work of the student be taken in a hospital not under direct control of the university? The incorporation of the internship in the curriculum as the second clinical year might mean that the student would spend only one year in a university hospital. With internship education distributed as it is today (see Chapter 3, Table 3.8), the advantages of a carefully controlled medical environment and full-time teachers would be curtailed for many students. I believe this would be a step backwards.

Another problem that has been raised is the need for teaching basic sciences to the resident, the prospective specialist. Does the resident require additional knowledge in certain areas of basic science? There would be little disagreement that the resident must expand his knowledge of biochemistry, physiology, or pathology. The areas of interest would be those most applicable to the needs of his special field. For example, the anesthesiologist must have a sound knowledge of respiratory physiology.

Does the resident need additional training in the methods of science? It would be ideal for each resident to participate in some way in a well-designed research project. Only in this way can he achieve a sound concept of the experimental method and the evaluation of scientific evidence.

In conclusion it is my firm conviction that it would be an error to reduce the time spent by the medical student on clinical work in the carefully designed setting of a university hospital. This period of study not only permits the student to acquire experience in dealing with human problems but also permits him to receive instruction in the methods of science. The application of the method of science to the study of disease provides motivation to the student because his ultimate goal is to become a physician.

C. A Final Word

BY J. ENGLEBERT DUNPHY

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That part of the Institute program dealing with the medical curriculum, particularly the proposal for concentrating on basic sciences during the first two years, is summarized briefly. Reactions to the proposal indicate agreement that preclinical sciences are the foundation of medicine, but there is less enthusiasm for delaying clinical integration.

IT WAS Dr. George Packer Berry who asked: "What makes the awarding of the M.D. degree so often a barrier to further education? How can the university extend its influence more effectively into the postdoctoral years?" During the pre-Institute planning, when the subcommittee for Topic I, Medical School Curricula: An Operation on Clinical Teaching, considered this aspect of medical education, it quickly convinced itself that answers were only to be found in the earlier training of the physician. When the young postgraduate fails to orbit properly, the reasons relate to faulty aiming and propulsive power, both of which should have been supplied at an earlier date. Thus, our subcommittee delved into problems that had concerned earlier Institutes on teaching in the preclinical disciplines. The college years, secondary education, and family influences all came in for discussion, showing that no matter how we dissect it education is a continuum (and so are institutes on teaching).

Everything considered, a majority of interns and residents perform effectively, but when deficiencies appear they seem to be related to two principal factors: (1) inadequate or misdirected motivation and (2) a failure to use the scientific method in the practice of medicine. An aspect of medical education that seemed to our subcommittee to be fundamental to this problem is the loss of stature of the preclinical disciplines. The clinical disciplines are usurping more and more time in the education of the physician. This is true at the undergraduate as well as the graduate level, where clinical teaching has been enormously expanded through residency training. Thus, 30 years ago the total time devoted to the formal education of the physician was five or six years, of which two were largely in the preclinical disciplines. Today it takes an average of eight years to train a physician, and less than two years are devoted to the "basic sciences."

As an antidote for these undesirable features of medical education, the following were proposed as An Operation on Clinical Teaching, presented at the Institute and reproduced in Chapter 1, Section A:

1. That the first and second years of medical education be devoted primarily to the preclinical disciplines, incorporating newer areas for study such as genetics and radiobiology. The departmental chairmen in these fields should be allowed to teach their science for its own sake with the expectation that they will then include the foundation for tomorrow's medicine as well as the structure of today's. This will restore the preclinical disciplines to their proper place in medical education. For the student, a vigorous two years of study in the basic

sciences is more likely to provide a grasp of the philosophy of science than two years of "integrated teaching" during which the student imagines himself to be a physician while he receives a superficial exposure to science.

2. That the third year of medical school be made a period for "concentrated integrated teaching." Once the student has acquired a grasp of the basic sciences and an understanding of the philosophy of science, he can be shown more readily how to use this information if a strong bridge is built between the first two years and the third year of medical education. Instead of bringing the clinical years into the first two years, the objective of this proposal is to bring the science of medicine into the clinical years. The fourth year of medical school under the proposed scheme would be a clinical clerkship similar to that currently offered in most medical schools today.
3. That the universities assume more responsibility for the internship year, thus providing a final impetus and motivational guide to this stage of the young physician's course into orbit.

The background for these controversial proposals were considered in detail at the Institute. Dr. Carroll B. Larson (Chapter 1, Section C) emphasized the importance of motivation and orientation for the embryo student of medicine. Dr. Joseph F. Artusio, Jr., (Chapter 1, Section D) pointed out the difficulties that the medical graduate encounters when called upon to utilize his knowledge in a special field. Dr. Howard C. Taylor, Jr., (Chapter 1, Section B) indicated the need for more time for the teaching of basic disciplines in medical education. Last but not least, if the university is to assume more responsibility for education after graduation, it must extend its influence on hospitals and institutions beyond its immediate jurisdiction. Some experiences in this area were described by Dr. George C. Ham (Chapter 1, Section E).

These speakers were followed by Dr. Philip Handler and Dr. Richard V. Ebert, who presented the postoperative reactions of a biochemist and an internist respectively. Their papers appear in the preceding sections of this chapter.

The reaction of the Institute discussion groups to the curricular proposal merits a brief commentary here. On the whole, it was unfavorable to the proposed changes. One participant felt that the adoption of the proposed change in the curriculum would set medical education back 50 years! On the other hand, another made a plea for a "return to the analytical and deductive approach to the study of medical science, believing that intensive study of certain small segments of medical knowledge can provide a rewarding learning experience." It was felt by this participant that something of value had been lost from our teaching methods by too-early attempts to promote integration of clinical thinking; the basic science taught by clinicians is in many instances of a superficial character and less than ideal.

The majority opinion in Institute discussion groups favored the introduction of clinical medicine into the curriculum at an early period as a means of stimulating the students and demonstrating important relations in various preclinical disciplines. It was felt that this could be accomplished without dilution of the preclinical sciences, and that scholarship and learning in depth could be preserved. Extensive exploration of some basic discipline for its own sake might best

be combined with clinical medicine at a later date in the manner recommended by Dr. Handler.

It was evident to all Institute participants that if student and faculty are good, many approaches will attain the same end. Considerable discussion focused on the problems of attracting and selecting students for medicine. There was a feeling that particular people have an unusual personnel aptitude, and that if they can be recognized, they should be made permanent members of admissions committees and perhaps be assigned a key role in the university.

In summary, there was general Institute agreement on several points. The students must be the best possible and a continued effort to attract them is essential. The preclinical sciences are the foundation stones of medicine, but the principal objective of medical education is for the student to obtain a firm grasp of the scientific method rather than any particular mass of factual information. The acquisition of certain factual information is essential to a basic understanding of medicine. Moreover, the student must develop clinical skill if he is to apply his knowledge. He must learn to take a history, to do a physical examination, and to interpret laboratory data in relation to the natural history of disease.

The ultimate goal is the better care of the sick. The first step is the selection of intelligent young men and women motivated toward a life of personal sacrifice. Once selected, these individuals must acquire a certain body of knowledge and an understanding of the scientific method as it applies to human biology. It is hoped that by precept and example they will learn to apply this knowledge with compassion and sympathy to their patients. At the very same time, and from the same pool of individuals, those must be found who will choose a life of inquiry into the fundamental nature of biological systems; on their contributions the medicine of tomorrow will be built.

This is a big order. Confronted by it, one feels humble, self-critical, and inadequate. The ultimate goal may never be reached. The struggle may be difficult and at times may seem pointless, but like mountain climbing, rowing, or the exploration of any biological phenomenon, either in the laboratory or in the clinic, it has its own reward.

CHAPTER 3

The Internship: Fact and Opinion

A. Some Characteristics of 1958-59 Interns and Internships

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This section reports the results of a study of the clerkship and internship, as viewed by 1958-59 interns. The sample is described according to five classifications: measured ability, career plans, affiliation of internship hospital, expenditure level of medical school, and type of internship served. These five classifications are considered in discussing respondent opinion on internship experience: its educational value, contribution to professional development, and balance between theory and practical application. There is some evidence that the present-day internship is not serving its function well. Those who plan to go directly into general practice are less pleased with their internship experience than those who plan careers in specialty practice or teaching and research.

PRESENT-DAY interns can be characterized within the framework of any number of taxonomies. For this study, which proposes to examine the opinions of 1958-59 interns about the educational value of their clerkship and internship experiences, we have chosen a few taxonomies which are believed to be particularly relevant. Ability levels, career aspirations, and types of hospitals in which internships are being served have been employed as the principal frames of reference within which results are discussed; the financial classification of the medical school from which the intern graduated and the type of internship he is serving are also considered in connection with some questions. Assumptions about cause and effect relationships need not be made to examine the correlations among these dimensions of differences among medical college graduates, for the purpose here is only to describe, not to prescribe.

We have taken each of the three principal taxonomies in turn as a point of reference to provide a stereoscopic view of the men and women whose opinions are discussed in the sections that follow. First, however, a few paragraphs about questionnaire returns and about the classifications used in analyzing these data are in order.

The sample

Of the 3135 questionnaires that were mailed to a 50 per cent random sample of 1958-59 interns, 2616 (83 per cent) were returned in time to be used in the

study. (A copy of the questionnaire will be found in Appendix C.) Respondents were compared with nonrespondents with respect to ability as measured by the Medical College Admission Test (MCAT), types of hospitals at which internships were being served, and financial classifications of medical schools attended to determine if the respondents were representative of all 1958-59 interns in terms of these important social and psychological variables. The results, reported in detail in Appendix C, show that they are representative; the per cent of responding and per cent of nonresponding interns in each of the ten categories employed in the tests are almost identical. A description of the responding sample in terms of each of the taxonomic breakdowns employed in the analysis follows:

1. Medical College Admission Test (MCAT) level

Verbal and Quantitative Ability scores on the MCAT were obtained from AAMC records for all 1958-59 interns in the 50 per cent random sample employed in this study. These scores were summed and, on the basis of the resulting frequency distribution of combined scores, individuals were assigned to one of three categories: high, middle, or low. It may be noted that this distribution of abilities is typical of present-day medical school graduates. The ranges of scores included in each category and the number of respondents that fall into each group follow:

DESCRIPTIVE CLASS	MCAT (VA + QA)/2	RESPONDENTS	
	RANGE	N	%
High	580 or higher	603	23
Middle	470-579	1303	50
Low	below 470	598	23
No MCAT		112	4

2. Career plans

The basis for this classification was response to question 2 of the Intern questionnaire regarding the type of career within the field of medicine that the individual ultimately planned to pursue. The following five categories were retained:

TYPE OF CAREER	RESPONDENTS	
	N	%
General practice	560	21
Specialty practice	1320	50
Combination of specialty practice, teaching and/or research	643	25
Teaching and/or research	49	2
Other	17	1
No response	27	1

3. Teaching affiliation of internship hospital

The AMA Council on Medical Education and Hospitals classifies hospitals according to the type of teaching affiliation they maintain with one or more medical schools. The categories used in this classification and the number of respondents serving internships in each type are:

TYPE OF AFFILIATION	RESPONDENTS	
	N	%
Major teaching hospital	1325	50
Minor teaching hospital	174	7
Nonaffiliated hospital	1117	43

4. Expenditure level of medical school

Medical schools from which the interns had graduated were classified with respect to total estimated expenditures of the school for 1957-58, as reported to the AAMC-AMA Liaison Committee on Medical Education at the end of the fiscal year. The respondents from schools at each expenditure level were as follows:

DESCRIPTIVE CLASSIFICATION	EXPENDITURE LEVEL OF MEDICAL SCHOOL (IN MILLIONS)	RESPONDENTS	
		N	%
High	3.5 or more	973	37
Middle	2.0-3.5	1085	42
Low	under 2.0	558	21

5. Type of internship

Individuals were classified according to the types of internships they were serving, as indicated by their responses to question 1 of the questionnaire. The following categories have been retained:

TYPE OF INTERNSHIP	RESPONDENTS	
	N	%
Rotating general	2130	81
Straight medical	226	9
Straight surgical	114	4
Mixed and other	145	6
Undetermined	1	*
Total	2616	100

* Less than .5 per cent response.

CHARACTERISTICS OF THE 1958-59 INTERN

The taxonomies that were selected to provide the framework for discussion of questionnaire responses were chosen because they are significant determinants of the complexion of both present-day medical education and of its future as well. In presenting a description of the intern of today, we have drawn on the results of other studies, aiming thereby to provide a more comprehensive background against which to consider the opinions of the subjects of this study.

Levels of intellectual ability

Nearly a quarter of these latest entrants into the medical profession are intellectually capable to the extent that nothing but misfortune or their own lack of interest and motivation stands in the way of their making substantial contributions to the science of medicine (Appendix Table C-1). Compared with

TABLE 3.1
CAREERS PLANNED BY INTERNS AT DIFFERENT LEVELS OF ABILITY

Career plans	MCAT level									
	High		Middle		Low		No MCAT		Total	
	N	%	N	%	N	%	N	%	N	%
General practice	79	13	291	22	167	28	23	21	560	21
Specialty practice	257	43	696	53	318	53	49	43	1320	50
Specialty practice, teaching &/or research	231	38	280	22	100	17	32	29	643	25
Teaching &/or research	26	4	15	1	2	*	6	5	49	2
Other	5	1	9	1	2	*	1	1	17	1
No response	5	1	12	1	9	2	1	1	27	1
Total	603	100	1303	100	598	100	112	100	2616	100

* Less than .5 per cent response.

college students in general they would rank among the top 5 to 8 per cent, and on the Army General Classification Test (AGCT) they would score approximately 140 or higher.

These figures are consistent with data on other medical school classes that have been gathered in recent years,¹ and when we consider that nearly two thousand of the young physicians who are launched into the field each year fall into this category, we cannot but be impressed with the amount of talent that is concentrated in the profession.

The middle 50 per cent of our interns, who will represent what might be called the hard core of their generation of practicing physicians, are drawn from the upper half of the college student population. Many of these at the upper end of this category will likely make far more significant contributions to the profession than many of their ostensibly more brilliant colleagues in the top 25 per cent. Intellectual ability is a necessary, but by no means a sufficient, condition for either learning or performance, whether as a test taker, as a physician treating a patient, or as an experimenter advancing the science of medicine.

It is notable that at the point of completion of their internships over half of the intellectually highly talented, and three-fourths of those at the next level of ability, plan to make no contribution to the next generation through teaching and/or research activity, i.e., they plan straight medical practice careers (see Table 3.1). Only 4 per cent and 1 per cent respectively of the high- and middle-ability level groups plan to devote themselves exclusively to teaching and research careers. A larger proportion of the high-ability group than of the middle group (38 per cent vs. 21 per cent) plan to combine teaching and research with specialty practice, but the middle group will actually supply the greater number of individuals to this category of physicians—assuming, of course, that their present aspirations are realized.

It is of course possible that some of these individuals will be challenged or inspired to broaden their perspectives during residency training or subsequent

¹ Gee, Helen Hofer, "Differential Characteristics of Student Bodies: Implications for the Study of Medical Education," in *Selection and Educational Differentiation* (Berkeley, California: Field Service Center and Center for the Study of Higher Education, University of California, 1960), pp. 125-54.

TABLE 3.2
TYPES OF HOSPITALS AT WHICH STUDENTS AT DIFFERENT LEVELS OF ABILITY ARE SERVING THEIR INTERNSHIPS

Hospital affiliation	MCAT level							
	High		Middle		Low		No MCAT	
	N	%	N	%	N	%	N	%
Major	385	64	655	50	239	40	46	41
Minor	34	6	89	7	46	8	5	4
None	184	30	559	43	313	52	61	55
Total	603	100	1303	100	598	100	112	100

experiences in practice, but the evidence is clear that the majority of talented young physicians do not aspire to the highest level of exercise of their talents and thus to making the kind of direct contribution to the advancement of their profession that teaching and research activities represent.

The fourth quarter of graduate physicians, when tested as medical applicants, performed at a level below that of the average college student. On the AGCT they would be expected to obtain scores of 120 or lower. A few of them may possibly be well endowed intellectually; tests are not infallible and varieties of circumstances can result in their yielding underestimates of abilities from time to time. In general, however, these individuals have less of the kind of talent that is involved in interpreting and manipulating written verbal and quantitative symbols than do their peers. They have, however, fulfilled the requirements of their separate medical schools; they have been granted M.D. degrees, a fact which itself attests to a high degree of motivation to achieve. Fortunately, few of these students aspire to careers involving teaching and research, for it is likely that only the very exceptional individual at this level can hope to contribute substantially in these directions.

Despite their limited intellectual capacities, nearly three-fourths (70 per cent) of this lower-ability group are planning careers that involve extended graduate training. It is notable in this connection that over half of them are interning at hospitals that are not affiliated with medical schools (see Table 3.2), whereas less than a third of the high-ability students have a nonaffiliated hospital connection.

Since three-fourths of all of the 1958-59 interns were matched into their first-choice hospital, and another 15 per cent into their second-choice, it is clear that most of the low-ability students have chosen for themselves the hospitals they are in. These considerations tempt a speculation that poorer students seek out nonaffiliated hospitals in the hope of obtaining residencies which they anticipate would be denied them in major teaching hospitals. In any case, the existing relationship between ability level and type of hospital at which the internship is served can have only the effect of increasing differences among practicing physicians. We may justifiably assume that major teaching hospitals provide a superior learning opportunity, thus the differences that already exist between high- and low-ability students at the start of the internship year become increasingly emphasized.

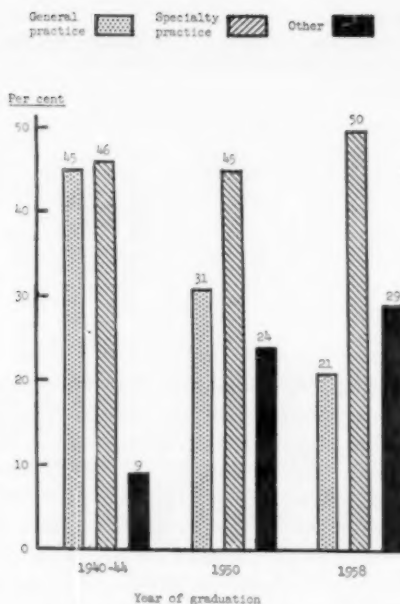


FIG. 1.—Percentage of students choosing various medical careers according to year of graduation.

Career plans and graduate education

Judging from the expressed intentions of 1958-59 interns, and from trends over the past two decades, the general practitioner is in some danger of becoming extinct. Dickenson's² study of medical school alumni provides information about students graduated from medical schools between 1940 and 1944, which may be compared with expressed plans of 1958-59 interns and with the status reports of 1950 physicians which were obtained in connection with the survey reported in Chapter 11 of this book. It is apparent from Figure 1 and Table 3.3 that the shift in types of physicians' careers during the past two decades is not primarily a shift from general to straight specialty practice. Although categories used in Dickenson's study, in AMA records, and in the AAMC questionnaires are not altogether comparable, it appears that the proportion of graduates who aspire to straight specialty practice careers remains fairly stable and, although general practice attracts fewer and fewer physicians, greater numbers are enter-

² Information on 1940-44 graduates was obtained from Table 1a of Dickenson, F. G., "Distribution of Medical School Alumni in the United States as of April, 1950," *Misc. Pub. M-94*, AMA, Chicago, 1955. Dickenson's data show 22.1 per cent of his sample of 1940-44 graduates were residents when his data were gathered. We have added these to the 18.5 per cent who are designated as "full-time" specialists. Dickenson has another group designated as "part-time" specialists in which 5.8 per cent of the graduates were placed. These have also been added to the specialist group since comparison of reports of 1950 graduates (Table 3.3) with AMA records (Appendix C, Table C.5) indicates that these individuals for the most part call themselves specialists.

TABLE 3.3
CAREER PLANS OF 1950 AND 1958
MEDICAL SCHOOL GRADUATES

Career plans	1950 graduates		1958 graduates	
	N	%	N	%
General practice	597	31	560	21
Specialty practice	874	45	1320	50
Specialty practice, teaching &/or re- search	355	18	643	25
Teaching &/or research	86	4	49	2
Other	36	2	17	1
No response	5	*	27	1
Total	1953	100	2616	100

* Less than .5 per cent response.

TABLE 3.4
NUMBER AND PER CENT OF INTERNS
PLANNING ONE OR MORE YEARS OF
ADDITIONAL STUDY IN
VARIOUS AREAS

(Multiple response)		
Area of study	N	%
Residency and clinical fellowship	2270	87
Research fellowship	249	10
Graduate school	93	4
Other	40	2
No response	176	7

ing "other" careers. Table 3.3, which gives directly comparable information on 1950 and 1958 graduates, suggests that the important direction of development is toward careers in which teaching and research are combined with practice. Note that, although only 4 per cent of the 1950 graduates are engaged exclusively in teaching and research, the proportion of interns planning such a career has dropped still farther, to 2 per cent. Dr. Charles G. Child, III, in his paper "Medical Care and Medical Service Plans,"³ which was delivered at the 1958 Teaching Institute, encouraged the development of medical service plans that would attract young physicians to academic careers in clinical medicine. Although these data show that such a trend is established, many more capable teachers and researchers are needed in medicine and, as Dr. Child indicated, the trend can be encouraged only if such combined careers can be made intellectually and financially attractive.

The nature of the trend away from general practice means larger and larger proportions of interns are seeking residency training in specific specialties. Specialty training is thus more and more an integral part of the education of the physician. In fact, almost all present-day interns, whether generalists or specialists, plan at least some additional training beyond the internship (Table 3.4). Only 7 per cent of this year's interns failed to indicate some plans for

TABLE 3.5
MCAT LEVELS OF INTERNS PLANNING VARIOUS TYPES OF CAREERS

MCAT level	Career plans									
	General practice		Specialty practice		Specialty practice, teaching- research		Teaching and/or research		Other	
	N	%	N	%	N	%	N	%	N	%
High	79	14	257	19	231	36	26	53	5	29
Middle	291	52	696	53	280	43	15	31	9	53
Low	167	30	318	24	100	16	2	4	2	12
No MCAT	23	4	49	4	32	5	6	12	1	6
Total	560	100	1320	100	643	100	49	100	17	100

³ In Gee, Helen Hofer, and Richmond, Julius B. (eds.), *Report of the First Institute on Clinical Teaching* (Evanston, Illinois: Association of American Medical Colleges, 1959), pp. 35-46.

TABLE 3.6
TYPE OF HOSPITAL CHOSEN BY INTERNS PLANNING
VARIOUS TYPES OF CAREERS

Hospital affiliation	Career plans											
	General practice		Specialty practice		Specialty practice, teaching- research		Teaching and/or research		Other		No response	
	N	%	N	%	N	%	N	%	N	%	N	%
Major	145	26	657	50	454	71	46	94	7	41	16	60
Minor	53	9	94	7	24	4	1	2	0	0	2	7
None	362	65	569	43	165	25	2	4	10	59	9	33
Total	560	100	1320	100	643	100	49	100	17	100	27	100

further training. Their failure to respond to the question may or may not indicate they plan to seek no additional educational opportunity.

We may consider the future from the standpoint of professional societies. What will be the backgrounds of recruits from the 1958 class into the American Academy of General Practice, for example? Half will come from the middle range of intellectual ability, and relatively few from the upper end of this range (Table 3.5). Three out of ten will come from the lowest ability level echelon. Expectations of the specialty boards and societies are not so very different, in this respect. One out of four who plan to enter specialty practice have limited learning capacities.

The generalists and specialists are more sharply distinguished with respect to the affiliations of their internship hospitals (Table 3.6) than by differences in distributions of abilities. Two-thirds of the G.P.'s, as opposed to one-half of the future specialty practitioners, will have served internships in nonteaching hospitals. In this, both groups are even more sharply distinguished from interns planning at least some involvement in teaching and/or research, the great majority of whom serve their internships in major teaching hospitals.

The same hierarchical relation pertains with respect to the kinds of medical schools these various groups attended. The higher the student's level of aspiration, the greater is the likelihood that he attended a medical school that had a large budget at its disposal (Table 3.7), and hence, by implication, good facilities for teaching. It is true that only about 2 per cent of the interns in this sample plan to establish straight teaching and/or research careers. However, this 2 per cent differs markedly from those planning other types of careers

TABLE 3.7
EXPENDITURE LEVELS OF THE MEDICAL SCHOOLS ATTENDED
BY INTERNS PLANNING DIFFERENT TYPES OF CAREERS

Expenditure level	Career plans											
	General practice		Specialty practice		Specialty practice, teaching-research		Teaching and/or research		Other		No response	
	N	%	N	%	N	%	N	%	N	%	N	%
High	161	29	447	34	321	50	27	55	7	41	10	37
Middle	270	48	590	45	193	30	15	31	6	35	11	41
Low	129	23	283	21	129	20	7	14	4	24	6	22
Total	560	100	1320	100	643	100	49	100	17	100	27	100

TABLE 3.8
TYPE OF HOSPITAL AT WHICH
VARIOUS INTERNSHIPS ARE SERVED

Hospital affiliation	Type of internship							
	Rotating general		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%
Major	864	41	216	93	111	97	133	92
Minor	162	8	4	2	3	3	5	4
None	1104	51	6	3	0	0	7	5
Total	2130	100	226	100	114	100	145	100

with respect to MCAT level, type of medical school attended, and type of internship hospital. Over half of them are in the highest intellectual ability group; the majority come from high-expenditure medical schools, and 94 per cent serve their internships in major teaching hospitals. Interns who plan to combine a specialty practice with research and/or teaching (about 25 per cent of the total sample) lie between the straight specialty practice and straight teaching-research groups on all three of these characteristics.

Types of hospitals

A third point of reference from which our sample may be viewed is the setting in which the intern is spending this period of his training. The majority of internships (50 per cent) are served in major teaching hospitals. Only a slightly smaller per cent (43 per cent), however, are served in hospitals that maintain no affiliation with a medical school. Minor teaching hospitals play a relatively insignificant role, accounting as they do for only 7 per cent of the internships.

The environment in the major teaching hospital is clearly different from other types. Students for the most part are intellectually more able, and they are clearly more ambitious (see Tables 3.2 and 3.6). About 30 per cent of the interns in major teaching hospitals fall in the high-MCAT group, whereas only 16 per cent of those in unaffiliated hospitals and 20 per cent of those in minor hospitals obtained high MCAT scores.

Major teaching hospitals produce almost all of the interns who plan to enter teaching and/or research careers, about 70 per cent of those who plan to combine a specialty practice with teaching and/or research, about half of those planning a straight specialty practice, and only about one-fourth of those planning to enter general practice. Unaffiliated hospitals, on the other hand, produce only 4 per cent of the teaching-research interns, one-quarter of those who plan to combine specialty practice with teaching and/or research, about 43 per cent of those who intend to enter straight specialty practice, and 65 per cent of those planning to be general practitioners. Almost all straight medical and straight surgical internships are served in major teaching hospitals, and about four out of ten rotating general internships are served in them (Table 3.8).

The strong relation between career plans and affiliation of the internship hospital is highly significant. Although many senior students probably select non-teaching hospitals precisely because they plan straight practice careers, and some

perhaps because they feel they might enhance their chances of receiving residency appointments, it is not at all unlikely that the internship setting further influences their levels of aspiration. The incentives that the nonteaching hospital holds out and the temptations, if you will, to which it exposes the intern during his period of training are of a different sort than those the major teaching hospital has to offer.

Having explored the characteristics of our intern sample, it remains now to explore their attitudes toward their clinical and internship experiences and to determine if these background factors are related to them.

EVALUATION OF CLINICAL CLERKSHIPS AND THE INTERNSHIP

This section is devoted to a discussion of the intern's evaluation of his major clinical clerkships, his feelings about the educational value of the internship experience, his opinions concerning specific ways in which the internship contributed to his professional development (or failed to contribute), and his judgments about whether or not his clerkship and internship experiences contained the proper balance between theory and practical application. In looking at each of these areas, we shall attempt to determine whether any significant relationship exists between the intern's opinions and such factors as the type of internship he served, the type of hospital at which this internship was served, his level of ability as measured by the Medical College Admission Test (MCAT), and the type of medical school from which he came.

Evaluation of clerkships

Generally speaking, the clerkship in the department of medicine was considered the most valuable of any of the major clerkships (Table 3.9), receiving an "excellent" rating from about half of the sample. Next in line was the clerkship in obstetrics and gynecology, followed in order by the clerkships in pediatrics, surgery, and psychiatry. The clerkships tended to maintain their same relative positions regardless of the type of internship being served, with one notable exception (Table 3.10). Those individuals serving straight surgical internships rated their surgery clerkships second only to their medicine clerkships, instead of fourth as did those serving other types of internships. It is interesting to note, however, that even the straight surgical interns felt that their clerkship in medicine was the most valuable.

TABLE 3.9
EVALUATION OF MAJOR CLINICAL CLERKSHIPS

Clerkship	Value									
	Excellent		Good		Fair		Poor		No response	
	N	%	N	%	N	%	N	%	N	%
Medicine	1313	50	954	36	278	11	50	2	21	1
Ob.-Gyne.	1042	40	965	37	439	17	134	5	36	1
Pediatrics	832	32	1062	41	539	21	142	5	41	1
Psychiatry	453	17	760	29	777	30	501	19	125	5
Surgery	606	23	1052	40	663	26	268	10	27	1
									2616	100

TABLE 3.10
AVERAGE RATINGS OF CLINICAL CLERKSHIPS BY INTERNS
SERVING VARIOUS TYPES OF INTERNSHIPS*

Type of internship	Clinical Clerkship									
	Medicine		Ob.-Gyne.		Pediatrics		Psychiatry		Surgery	
	N	Av.	N	Av.	N	Av.	N	Av.	N	Av.
Rotating general	2116	1.66	2113	1.84	2102	1.98	2034	2.55	2116	2.24
Straight medical	223	1.46	218	2.10	218	2.13	213	2.36	219	2.26
Straight surgical	111	1.65	109	1.94	110	2.12	107	2.62	113	1.75
Mixed and other	144	1.66	139	1.91	144	1.88	136	2.54	140	2.44

* Averages are based on a scale where: excellent = 1, good = 2, fair = 3, and poor = 4.

Even though the relative rank position of the various clerkships remained quite constant when broken down according to type of internship being served, it is interesting to compare the ratings the four internship groups gave to each of the five clerkships. Numbers from 1 (excellent) to 4 (poor) were assigned to the various rating categories and these were averaged. The medicine clerkship received its highest average rating from interns serving straight medical internships, the obstetrics and gynecology clerkship was rated highest by rotating general interns, and the pediatric clerkship was rated highest by those serving "mixed or other" (including straight pediatric) internships. Are these tendencies indicative of different patterns of interest among these groups? Does the quality of the clerkship influence selection of type of internship? These data do not supply answers, but other AAMC studies are considering these questions.

A substantial majority (71 per cent) of the interns felt that their clerkships had been well balanced between theory and practice (Table 3.11). Only about 1 in 5 thought that his clerkships had been too theoretical, and less than 1 in 10 felt that they had been too practical.

The intern's judgment about the balance between theory and practice in his clerkship was to some degree a function of the type of medical school from which he came, his plans for a medical career, and the type of internship he served. It did not appear to be affected by the type of hospital at which he served his internship or his general level of ability as measured by the MCAT.

Interns serving straight surgical internships were apparently more satisfied with their clerkships than those serving other types (Table 3.12), and those planning to enter teaching-research careers were slightly more satisfied than those planning other types of careers (Table 3.13). In general, the percentage of

TABLE 3.11
INTERN OPINION ON BAL-
ANCE BETWEEN THEORY
AND PRACTICE IN HIS
CLINICAL CLERK-
SHIP

Evaluation of clerkships	N	%
Too theoretical	523	20
Too practical	176	7
Well balanced	1856	71
No response	61	2
Total	2616	100

TABLE 3.12
BALANCE BETWEEN THEORY AND PRACTICE IN CLERKSHIP
ACCORDING TO TYPE OF INTERNSHIP SERVED

Evaluation of clerkships	Type of internship							
	Rotating general		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%
Too theoretical	461	22	27	12	13	11	22	15
Too practical	131	6	26	12	6	5	13	9
Well balanced	1493	70	166	73	93	82	103	71
No response	45	2	7	3	2	2	7	5
Total	2130	100	226	100	114	100	145	100

individuals who felt that their clerkships had been well balanced decreased as the expenditure level of their medical school increased (Table 3.14). This trend, however, holds only for those who plan to enter general practice or specialty practice. Within the groups planning a career involving some teaching and/or research, the proportion of individuals who felt that they had had well-balanced clerkships increases as the expenditure level of their medical school increases. Moreover, when the responses of individuals who felt that their clerkships had not been well balanced are examined, one finds that the majority of complaints registered by those planning general practice or specialty practice indicated that the clerkships had been too theoretical, whereas the majority of dissatisfied teaching-research people felt that their clerkships had been too practical.

It is apparent that individuals planning different types of careers vary with respect to their feeling of need for practical experience in dealing with patients, and it appears also that low-expenditure medical schools tend to provide more of this type of experience than high-expenditure schools. The intern who plans to devote himself exclusively to the practice of medicine wants more practical experience during his clerkship, and apparently is more likely to have this need satisfied at a low-expenditure school. The future academician, on the other hand, has a stronger need for additional formal, theoretical instruction during his clerkships, and is more likely to find it in a high-expenditure school. Whether or not this state of affairs is desirable from the point of view of the physician's eventual effectiveness—whatever the nature of his career—is an important question which cannot be answered from these data. However, as basic research on criteria for measuring effectiveness in the profession is advanced, it may be possible to provide factual answers to questions of this sort.

TABLE 3.13
BALANCE BETWEEN THEORY AND PRACTICE IN CLERKSHIP
ACCORDING TO INTERN'S CAREER PLANS

Evaluation of clerkships	Career plans											
	General practice		Specialty practice		Specialty practice, teaching-research		Teaching and/or research		Other		No response	
	N	%	N	%	N	%	N	%	N	%	N	%
Too theoretical	146	26	262	20	106	16	3	6	3	18	3	11
Too practical	18	3	86	7	56	9	7	14	2	12	7	26
Well balanced	382	68	911	71	468	73	38	78	11	64	16	59
No response	14	3	31	2	13	2	1	2	1	6	1	4
Total	560	100	1320	100	643	100	49	100	17	100	27	100

TABLE 3.14
BALANCE BETWEEN THEORY AND PRACTICE IN CLERKSHIPS OF INTERNS
FROM DIFFERENT TYPES OF MEDICAL SCHOOLS
WHO PLAN VARIOUS CAREERS

Career plan	Medical school expenditure level	Evaluation of clerkships									
		Too theoretical		Too practical		Well balanced		No response		Total	
		N	%	N	%	N	%	N	%	N	%
General practice	Low	24	19	6	5	95	73	4	3	129	100
	Middle	67	25	6	2	192	71	5	2	270	100
	High	55	34	6	4	95	59	5	3	161	100
Specialty practice	Low	43	15	25	9	212	75	3	1	283	100
	Middle	111	19	39	7	423	71	17	3	590	100
	High	108	24	22	5	306	69	11	2	447	100
Specialty practice, teaching and/or research	Low	16	12	20	16	80	70	3	2	139	100
	Middle	27	14	22	14	141	73	3	2	183	100
	High	63	26	13	4	237	74	7	2	321	100
Teaching and/or research	Low & middle	1	5	3	13	17	77	1	5	22	100
	High	2	7	4	15	21	78	0	0	27	100
Other and no response	All levels	6	14	9	20	27	61	2	5	44	100
	Low	84	15	52	9	412	74	10	2	558	100
	Middle	208	19	73	7	777	72	27	2	1087	100
Subtotal	High	231	24	51	5	667	69	24	2	973	100
		523	20	176	7	1856	71	61	2	2616	100
Grand total											

TABLE 3.15
VALUE OF INTERNSHIP
AS AN EDUCATION-
AL EXPERIENCE

Value of internship	N	%
Much	1896	72
Some	577	22
Little	120	5
None	13	*
No response	10	*
Total	2616	100

* Less than .5 per cent response.

Evaluation of internship

On the whole, it appeared that interns felt the internship had been a valuable experience above and beyond the clerkship (Table 3.15). Seven out of 10 interns indicated that the internship had been of much value, and less than one in 20 felt that it had been of little or no value. However, it becomes apparent upon perusal of written comments made by individuals who indicated that their internships had been of "some" value, that this response is often made in conjunction with fairly critical opinions. It is suggested that any response other than "much" should be viewed as an indication that the internship did not provide a very rewarding developmental experience.

The intern's evaluation of his internship was apparently related to his MCAT level, the type of internship he served, and the type of hospital at which the internship was served (Tables 3.16, 3.17, 3.18). It did not appear to be related to his career plans or to the type of medical school from which he came.

Individuals at high MCAT levels were more likely to indicate that their experiences had been of "much" value than those at middle- or low-MCAT levels, suggesting that brighter students are better able to make use of their opportunities. Interns in major teaching hospitals tended to rate their internships higher than those in minor or unaffiliated hospitals, a result that confirms the obvious. It is hardly a surprise to find that an education-oriented institution provides a more highly rated learning experience than one that is not so oriented. The straight medical internship received a larger percentage of high ratings than any

TABLE 3.16
VALUE OF INTERNSHIP ACCORDING TO
INTERN'S MCAT LEVEL

Value of internship	MCAT level							
	High		Middle		Low		No response	
	N	%	N	%	N	%	N	%
Much	472	78	926	71	416	70	82	73
Some	107	18	307	24	139	23	24	21
Little or none	22	4	67	5	38	6	6	5
No response	2	*	3	*	5	1	0	0
Total	603	100	1303	100	598	100	112	100

* Less than .5 per cent response.

TABLE 3.17
VALUE OF INTERNSHIP ACCORDING TO
TYPE OF INTERNSHIP SERVED

Value of internship	Type of internship							
	Rotating general		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%
Much	1482	70	205	91	85	75	123	85
Some	519	24	16	7	23	20	19	13
Little or none	122	6	4	2	5	4	2	1
No response	7	*	1	*	1	1	1	1
Total	2130	100	226	100	114	100	145	100

* Less than .5 per cent response.

TABLE 3.18
VALUE OF INTERNSHIP ACCORDING TO
TYPE OF INTERNSHIP HOSPITAL

Value of internship	Teaching affiliation of hospital					
	Major		Minor		None	
	N	%	N	%	N	%
Much	1033	78	125	72	738	66
Some	239	18	42	24	296	26
Little or none	48	4	7	4	78	7
No response	5	*	0	0	5	*
Total	1325	100	174	100	1117	100

* Less than .5 per cent response.

other type, followed by mixed and other (composed primarily of straight pediatric), straight surgical, and rotating general in that order.

In summary, it appears that the intern who felt that his experiences had been most valuable was the very able individual serving a straight internship in a major teaching hospital. Even though no over-all relationship was found between the intern's career plans and his evaluation of his internship, we find that differences do exist with respect to career plans when the type of hospital at which the internship is being served is also considered (Table 3.19). Those planning to enter straight specialty practice or planning to combine specialty practice with teaching and research tended to follow the pattern mentioned earlier, i.e., interns at major teaching hospitals tended to rate their internships higher than those at minor or unaffiliated hospitals. However, among interns planning to enter general practice, those at minor teaching hospitals were more satisfied with their experiences than those either at major teaching hospitals or at unaffiliated hospitals. Also, general practitioners as a group were more satisfied with their experiences at minor and nonteaching hospitals than were interns planning careers involving specialty training. At major teaching hospitals, on the other hand, general practice and specialty aspirants were about equally satisfied.

Knowing the ability distribution in hospitals, these results imply that the generally less able interns are also less critical of unaffiliated hospitals, but Table 3.20 reveals this is not actually the case. Here we find it is the low-ability students in the minor and nonteaching hospitals who are the most apt to be critical. We might speculate that more highly rewarding, responsible opportuni-

TABLE 3.19
VALUE OF INTERNSHIP ACCORDING TO INTERN'S CAREER PLANS
AND TYPE OF INTERNSHIP HOSPITAL

Career plan		Value of internship									
		Much		Some		Little or none		No response		Total	
		N	%	N	%	N	%	N	%	N	%
General practice	Major	111	76	26	18	7	5	1	1	145	100
	Minor	46	87	6	11	1	2	0	0	53	100
Specialty practice	None	259	71	80	22	21	6	2	1	362	100
	Major	514	78	119	18	23	4	1	0	657	100
	Minor	63	67	27	29	4	4	0	0	94	100
Specialty practice, teaching &/or research	None	358	62	164	29	44	8	3	1	569	100
	Major	356	78	80	18	16	4	2	0	454	100
Teaching &/or research	Minor & none	120	63	54	29	15	8	0	0	189	100
	All	36	74	11	22	1	2	1	2	49	100
Other and no response	All	33	75	10	23	1	2	0	0	44	100

TABLE 3.20
VALUE OF INTERNSHIP ACCORDING TO TYPE OF INTERNSHIP
HOSPITAL AND MCAT LEVEL OF INTERN

Hospital affiliation		Value of internship									
		Much		Some		Little or none		No response		Total	
		N	%	N	%	N	%	N	%	N	%
Major	High	313	81	58	15	12	3	2	1	385	100
	Middle	492	75	137	21	24	4	2	*	655	100
	Low	187	78	40	17	11	5	1	*	239	100
Minor	High	24	71	7	21	3	9	0	0	34	100
	Middle	66	74	21	24	2	2	0	0	89	100
	Low	31	68	13	28	2	4	0	0	46	100
None	High	135	73	42	23	7	4	0	0	184	100
	Middle	368	66	149	27	41	7	1	*	559	100
	Low	198	64	86	27	25	8	4	1	313	100

* Less than .5 per cent response.

ties are more likely to be withheld from low-ability people in these settings and, if such is the case, both their attitudes and their opportunities to benefit from experience are bound to suffer. In the education-oriented major teaching hospital, on the other hand, the low-ability students are evidently more likely to gain an experience that is commensurate with their capacities, in any case, the interns more frequently feel they are involved in a profitable experience.

These results again suggest that felt educational needs differ among groups planning different types of medical careers, and that there is no one "best" type of internship experience that will satisfy all of these needs. It should be remembered, however, that there is no guarantee that the experiences the intern himself feels are most valuable are in fact the ones that will contribute most to his development as a physician. These results simply indicate what the intern feels is important to him; we have no yardstick of future performance against which to compare his opinions.

Contributions to professional development

In question 7 interns were asked to indicate specific ways in which the internship contributed to their professional development. In responding to this ques-

TABLE 3.21
CONTRIBUTIONS OF INTERNSHIP TO INTERN'S
PROFESSIONAL DEVELOPMENT
(Multiple response)

Internship contributed by providing:	N	%
Increased responsibility for patients	2287	87
Increased number of patients	1803	69
Broader experience with varieties of disease	1883	72
Increased opportunity to acquire technical skills	2010	77
More instruction in the application of scientific knowledge to patient care	1136	43
Constructive review and criticism of your work with individual patients	1000	38
Other	229	9
No response	24	1

TABLE 3.22
CONTRIBUTIONS OF INTERNSHIP AT VARIOUS TYPES
OF HOSPITALS TO INTERN'S PRO-
FSSIONAL DEVELOPMENT
(Multiple response)

Internship contributed by providing:	Hospital affiliation					
	Major		Minor		None	
	N	%	N	%	N	%
Increased responsibility for patients	1200	91	153	88	934	84
Increased number of patients	923	70	110	63	770	69
Broader experience with varieties of disease	1058	80	116	67	709	63
Increased opportunity to acquire technical skills	1024	77	139	80	847	76
More instruction in the application of scientific knowledge to patient care	646	49	82	47	407	36
Constructive review and criticism of your work with individual patients	570	43	67	39	363	32
Other	107	8	13	7	108	10
No response	12	1	2	1	10	1
Total	1325		174		1117	

tion, individuals were requested to check as many of the suggested contributions as were applicable, and to add any others that had not been suggested. Therefore, all tables pertaining to this question are multiple-response tables in which percentages add to more than 100 per cent.

In general, the individual intern felt that his internship contributed most to his professional development by giving him an opportunity for greater responsibility in the care of patients and by helping him to acquire the technical skills that he will need in later practice (Table 3.21). He also felt that his internship was not characterized by providing instruction in the application of basic science knowledge to patient care nor by constructive criticism of his work with patients.

In addition to these general findings, it appears that hospitals having a major teaching affiliation made different kinds of contributions to the intern's development than those with a minor or no teaching affiliation (Table 3.22), and that the contributions made by one type of internship were different from those made by another (Table 3.23).

Various types of internships and types of hospitals differed very little with respect to the extent to which they contributed to the intern's development by providing increased responsibility for patient care. Rotating interns in minor teaching hospitals and individuals serving mixed and other internships were, however, relatively less enthusiastic about increased numbers of patients than were other groups, evidently because they more frequently had too many patients to treat. The straight medical and the mixed and other internships pro-

TABLE 3.23
CONTRIBUTIONS OF INTERNSHIP TO INTERN'S PROFESSIONAL DEVELOPMENT
ACCORDING TO TYPE OF INTERNSHIP AND TYPE OF HOSPITAL.
(Multiple response)

Internship contributed by providing:	Major hospital		Minor hospital		Rotating general Unaffiliated		Total		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
	Type of internship													
Increased responsibility for patients	784	91	142	88	922	84	1848	87	212	94	100	88	126	87
Increased number of patients	613	71	101	62	761	69	1475	69	161	71	82	72	84	58
Broader experience with varieties of disease	679	79	107	66	700	63	1486	70	198	88	75	66	123	85
Increased opportunity to acquire technical skills	678	78	130	80	838	76	1646	77	157	69	95	83	111	77
More instruction in the application of scientific knowledge to patient care	377	44	79	49	400	36	856	40	144	64	57	50	78	54
Constructive review and criticism of your work with individual patients	245	40	63	39	359	33	767	36	136	56	40	35	66	46
Other	70	8	13	8	103	10	188	9	19	8	11	10	11	8
No response	5	1	2	1	10	1	17	1	3	1	3	3	1	1

TABLE 3.24
DEFICIENCIES IN INTERSHIP
(Multiple response)

Internship failed to provide:	N	%
Sufficient responsibility for patient care	425	16
An adequate number of patients	107	4
Sufficient opportunity to treat patients adequately (too many patients)	594	23
Sufficient experience with varieties of disease	305	12
A sufficient opportunity to acquire technical skills	380	15
Adequate instruction in the application of scientific knowledge to patient care	899	34
Sufficient review and criticism of your work with individual patients	1234	47
Educational experiences that were more than mere duplications of clerkship experiences	525	20
Other	214	8
No response	583	22

vided broader experiences with varieties of disease than either the rotating general or the straight surgical internships. Also, among rotating interns, this breadth of experience was more frequently cited by those in major teaching hospitals than in minor or unaffiliated hospitals.

The straight surgical interns were more likely to cite the contribution of increased opportunity to acquire technical skills than was any other group, particularly as compared with those serving straight medical internships. More than 6 out of 10 straight medical interns felt they had benefited from more instruction in the application of scientific knowledge to patient care, whereas only about 4 out of 10 rotating general interns cited this contribution, and only about half of those serving surgical and mixed internships cited it. Rotating interns in minor teaching hospitals were more satisfied with the instruction they had received in the application of scientific knowledge than those in major or unaffiliated hospitals. It seems that the straight medical intern (who is almost always in a major teaching hospital) has a notably different experience from the rotating intern in the same hospital. Similarly, straight medical interns were considerably more satisfied with the amount of review and constructive criticism that they had received than those serving rotating general internships, and those in major teaching hospitals were more likely to cite this contribution than those in minor or unaffiliated hospitals.

Views about the nature of the contributions the internship made to his professional development are generally unrelated to the intern's ability level as measured by the MCAT or to the kind of medical school he came from.

Some differences were found among groups planning different types of careers, with the group planning to enter teaching and/or research tending to cite all specific types of contribution more often than other groups. However, practically all of the teaching-research interns were in major teaching hospitals, again suggesting that the observed differences may be attributable to differences among types of hospitals rather than to differences among groups planning different types of careers.

Question 8, which asked for ways in which the internship had failed to contribute to the intern's professional development, provided essentially a reflection of the pattern made by responses to the previous question. Thus, the internship tended to be considered not deficient with respect to the opportunities it provided for participation in the care of patients and for learning technical skills. It was considered most deficient with respect to the amount of review and

TABLE 3.25
DEFICIENCIES IN INTERNSHIP ACCORDING TO
TYPE OF INTERNSHIP SERVED

(Multiple response)

Internship failed to provide:	Type of internship							
	Rotating general		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%
Sufficient responsibility for patient care	387	18	13	6	14	12	11	8
An adequate number of patients	93	4	3	1	5	4	6	4
Sufficient opportunity to treat patients adequately (too many patients)	514	24	39	17	16	14	24	17
Sufficient experience with varieties of disease	258	12	14	6	20	18	13	9
A sufficient opportunity to acquire technical skills	337	16	7	3	25	22	11	8
Adequate instruction in the application of scientific knowledge to patient care	805	38	40	18	28	25	26	18
Sufficient review and criticism of your work with individual patients	1078	50	48	21	55	48	53	37
Educational experiences that were more than mere duplications of clerkship experiences	472	22	12	5	22	19	19	13
Other	168	8	24	11	9	8	13	9
No response	390	18	112	50	27	24	54	37
Total	2130	100	226	100	114	100	145	100

constructive criticism it offered and in the amount of instruction in the application of scientific knowledge it provided (Table 3.24). Indications of deficiencies were related to the type of hospital in which the internship was served and to the particular type of internship taken, in much the same way as specific contributions were related to these factors in responses to the preceding question. The two questions differed slightly with respect to the response categories offered for checking, however, and in addition to each of the areas contained in question 7, the intern was asked in question 8 to evaluate his opportunities to treat patients adequately and to indicate whether the internship had been more than a mere duplication of his clerkship experiences. Only 4 per cent of the entire group felt that the value of the internship experience had been affected by the pressures of too many patients (hence failing to provide sufficient opportunity to treat patients adequately).

However, about 1 in 5 felt that their internships had been little more than duplications of their clerkships, and apparently this criticism was related to the type of internship served and the type of hospital in which it was served. It was cited by 22 per cent of the rotating general interns, 19 per cent of the straight surgical interns, 13 per cent of those serving mixed and other internships, and by only 5 per cent of those in straight medical internships (Table 3.25). Almost one-fourth of the interns in unaffiliated hospitals viewed their internships as mere duplications of their clerkships, but only about 17 per cent of those in hospitals having some teaching affiliation gave this response. This criticism of the internship was also cited slightly more frequently by low-MCAT interns than by individuals at middle- or high-ability levels, and somewhat less frequently by individuals planning to enter teaching and/or research careers than by those with other career plans.

Even though the vast majority of medical college graduates felt the internship makes some contribution to their development, the proportion finding the experience to be simply a duplication of effort is too great to be viewed with equanimity. It is disquieting also to see half of all rotating and surgical interns felt their

work is inadequately reviewed, and that very few rotating interns in nonaffiliated hospitals receive adequate instruction in the application of scientific knowledge to patient care.

Balance between theory and practice in the internship

Although the majority of interns felt that their internships had been well balanced between theory and practice, fully one-third indicated that this experience had been too practical and hardly anyone thought it was too theoretical (Table 3.26). Only about half of the rotating general and straight surgical interns indicated that their internships had been well balanced, whereas about three-fourths of those serving straight medical or mixed and other types gave this response (Table 3.27).

Other factors that were related to the intern's opinion concerning the balance between theory and practice in the internship were his career plans, the expenditure level of the medical school from which he came, and the type of hospital at which he served his internship. About three-fourths of the interns planning to enter teaching and/or research indicated that their internships had been well balanced, as compared with only 58 per cent of those planning to combine a specialty practice with teaching and/or research (Table 3.28). The general and specialty straight practice groups revealed themselves to be closer to the latter group than to the former. Since we know that those interested in teaching and research have higher MCAT's, are more likely to have attended high-expendi-

TABLE 3.26
INTERN OPINION ON BAL-
ANCE BETWEEN THEORY
AND PRACTICE IN HIS
INTERNSHIP

Evaluation of internship	N	%
Too theoretical	83	3
Too practical	850	33
Well balanced	1567	60
No response	116	4
Total	2616	100

TABLE 3.27
BALANCE BETWEEN THEORY AND PRACTICE IN
INTERNSHIP ACCORDING TO TYPE OF
INTERNSHIP SERVED

Evaluation of internship	Type of internship							
	Rotating general		Straight medical		Straight surgical		Mixed & other	
	N	%	N	%	N	%	N	%
Too theoretical	75	4	3	1	1	1	4	3
Too practical	737	35	43	19	42	37	27	19
Well balanced	1218	56	173	77	67	58	109	75
No response	100	5	7	3	4	4	5	3
Total	2130	100	226	100	114	100	145	100

TABLE 3.28
BALANCE BETWEEN THEORY AND PRACTICE IN INTERNSHIP
ACCORDING TO INTERN'S CAREER PLANS

Evaluation of internship	Career plans											
	General practice		Specialty practice		Specialty practice, teaching- research		Teaching and/or research		Other		No response	
	N	%	N	%	N	%	N	%	N	%	N	%
Too theoretical	19	3	43	3	19	3	1	2	0	0	1	4
Too practical	173	31	425	32	227	35	11	22	6	35	8	30
Well balanced	340	61	789	60	373	58	36	74	11	65	18	66
No response	28	5	63	5	24	4	1	2	0	0	0	0
Total	560	100	1320	100	643	100	49	100	17	100	27	100

ture medical schools, and are almost certain to be interning at major teaching hospitals, inquiry into the relations among these taxonomies is in order.

Opinion about adequacy of the balance between theoretical and practical experiences in the internship is unrelated to level of ability as measured by the MCAT; medical school and hospital backgrounds, however, are related to the intern's opinions. Within each type of career group, except among teaching and research aspirants, opinion is related to the expenditure level of the school the student came from (Table 3.29). Interestingly, as the level of aspiration in terms of career choice rises among students from low-expenditure schools, so does satisfaction with the balance of experience in the internship. Interns from middle- and high-expenditure schools were more uniform and more favorable in their opinions about balance of experience regardless of level of aspiration.

These relations may well be explained in terms of past experiences and future expectations. Those who plan to specialize, and therefore anticipate having extensive additional opportunity to learn, are apt to view the balance of experiences during the internship with relatively greater composure. These expectations are superimposed upon reactions to previous experiences, and it may well be that the student from the low-expenditure school feels less secure about his fund of knowledge than the student from the high-expenditure school.

There is one reversal in this correlation between career plans and medical school background: a majority of interns planning combined practice and teaching or research careers who come from middle-expenditure schools feel their internships were not well-balanced. Whether this is a random sampling error or the result of a special set of dynamics we cannot say.

The data get too "thin" when we try to examine all factors simultaneously, so let us consider now only the type of school and the hospital aspects of the intern's experiences (Table 3.30). It is apparent that the more favorable the combination of medical school and internship experiences are from an educational opportunity standpoint, the more likely the intern is to consider his internship well-balanced. Thus, interns from high-expenditure medical schools who are interning at major teaching hospitals are most likely to judge their internship to be well-balanced. Students from low- or middle-expenditure medical schools in major or minor teaching hospitals and those from high-expenditure schools in minor and nonteaching hospitals are about equally likely to be satisfied with the balance of experience. The middle expenditure medical school education, fol-

TABLE 3.29
BALANCE BETWEEN THEORY AND PRACTICE IN INTERSHIPS OF INTERNS
FROM DIFFERENT TYPES OF MEDICAL SCHOOLS
WHO PLAN VARIOUS CAREERS

Career plan	Medical school expenditure level	Evaluation of internship									
		Too theoretical		Too practical		Well balanced		No response		Total	
		N	%	N	%	N	%	N	%	N	%
General practice	Low	6	5	50	39	63	48	10	8	129	100
	Middle	10	4	77	29	170	62	13	5	270	100
	High	3	2	46	29	107	66	5	3	161	100
Specialty practice	Low	10	4	102	36	151	53	20	7	283	100
	Middle	20	5	189	32	283	61	16	4	590	100
	High	13	3	134	36	283	63	17	4	447	100
Specialty practice, teaching and/or research	Low	4	3	49	37	73	57	3	2	129	100
	Middle	7	4	77	40	95	49	14	7	193	100
	High	8	2	101	32	205	64	7	2	321	100
Teaching and/or research	Low & middle	0	0	5	23	16	72	1	5	22	100
	High	1	4	6	22	20	74	0	0	27	100
All levels	Low	1	2	14	32	29	66	0	0	44	100
	Middle	21	4	208	37	299	53	33	6	588	100
	High	27	3	244	37	434	64	24	5	668	100
Other & no response	Low	25	3	295	36	624	64	29	3	973	100
Grand total		83	3	850	32	1567	61	116	4	2616	100

TABLE 3.30
BALANCE BETWEEN THEORY AND PRACTICE IN INTERNSHIP ACCORD-
ING TO EXPENDITURE LEVEL OF INTERN'S MEDICAL SCHOOL
AND TEACHING AFFILIATION OF HOSPITAL

Evaluation of internship											
Medical school expenditure level	Hospital affiliation	Too theoretical		Too practical		Well balanced		No response		Total	
		N	%	N	%	N	%	N	%	N	%
High	Major	16	3	171	29	394	66	12	2	593	100
	Minor	0	0	19	35	34	63	1	2	54	100
	None	9	3	105	32	196	60	16	5	326	100
Middle	Major	17	4	147	31	289	61	18	4	471	100
	Minor	1	1	26	35	43	57	5	7	75	100
	None	19	4	177	33	312	57	31	6	539	100
Low	Major	6	2	87	33	157	61	11	4	261	100
	Minor	1	2	15	33	28	63	1	2	45	100
	None	14	6	103	41	114	45	21	8	252	100
Subtotal	Major	39	3	405	31	840	63	41	3	1325	100
	Minor	2	1	60	34	105	61	7	4	174	100
	None	42	4	385	34	622	56	68	6	1117	100
Grand total		83	3	850	33	1567	60	116	4	2616	100

lowed by minor or nonteaching hospital internship, is somewhat less apt to produce satisfaction, although the majority still indicated a well-balanced internship. The student who goes from a low-expenditure medical school to a nonteaching hospital, however, is most likely to be dissatisfied, and he is dissatisfied because his internship is too practical. Almost all of these students anticipate careers in general or specialty practice; doubtless they are anxious about the adequacy of their preparation to assume full responsibility for patients.

SUMMARY

We have reviewed a series of questions involving evaluations of clerkship and internship experiences and have found that responses to each question are related in some way to membership in various subgroups—type of internship served, MCAT level, type of hospital, type of career anticipated, etc. The point of departure in the summary that follows is membership in a few of these groups.

Type of internship

In almost all instances rotating general interns rated their educational experiences lower than any other group. A sizable percentage felt that their clerkships had been too theoretical, and a somewhat larger number felt that their internships had been too practical. Their major sources of dissatisfaction were that the internship did not provide enough instruction in the application of basic science knowledge to the care of patients, and that it failed to provide enough constructive review and criticism of their work with individual patients.

The straight surgical interns generally felt they had received good, well-balanced clerkships, but were somewhat disappointed with their internships, both in general and with respect to the balance between theory and practice. Like the rotating interns, a significant percentage of the straight surgical interns felt that their internships had been too practical, and their major sources of dissatisfaction were the same as those cited by the rotating interns. Most of the straight surgical interns (83 per cent) indicated that the internship had contributed to

their development by providing increased opportunity to acquire technical skills. The surgical interns benefited from this kind of experience more often than any other group, but when deficiencies in the internship were checked, they also complained about lack of opportunity in this area more frequently than any other group. This apparent contradiction probably results because the acquisition of technical skills is of greater importance to the straight surgical intern than to others. However much he has gained, he feels a need for more, and of course the nature and quality of opportunities offered differ from one hospital to another.

Interns serving straight medical internships were somewhat less satisfied with the balance between theory and practice they had found in their clerkships than were those serving straight surgical internships, but the straight medical interns were by far the most enthusiastic group with respect to the over-all evaluation of their internships. A fairly large proportion (17 per cent) of this group felt they had not been given enough opportunity to acquire technical skills in the internship, but they apparently fared much better than other groups with respect to the amount of instruction they received in the application of basic science knowledge to patient care. They also received somewhat more constructive review and criticism of their work than other groups, but even so, less than half of the group cited this kind of experience as a specific contribution and about 1 in 5 specifically cited it as deficient.

Type of hospital

Considering the intern's over-all evaluation of his internship in terms of the type of hospital in which it took place, it is apparent that hospitals having some teaching affiliation with a medical school are rated higher than nonteaching hospitals, and that an internship in a major teaching hospital is generally considered more valuable than one in a minor hospital. This same trend occurs with respect to the balance between theory and practice in the internship and with respect to the specific ways in which the internship contributed or failed to contribute to the intern's professional development. Thus, the major teaching hospital was apt to provide a better opportunity than others in terms of responsibility for patient care, breadth of experience with varieties of disease, instruction in the application of the basic sciences to patient care, and constructive review and criticism of work with patients. The nonteaching hospital is apparently superior to the minor teaching hospital with respect to numbers of patients provided and opportunities to treat these patients adequately. The minor teaching hospital, on the other hand, provides better opportunities to acquire technical skills than either the major teaching hospital or the nonteaching hospital.

Career plans

If we consider career plans as lying on a continuum reflecting interest in academic medicine, placing general practice at one end and full-time teaching-research at the other, the evaluation of both clerkships and the internship becomes more favorable as we approach the teaching-research end of the scale. Interns planning to enter general practice or straight specialty practice were less

satisfied with the balance between theory and practice in their clerkships than were those planning to enter straight teaching-research careers or those planning to combine specialty practice with teaching and research. Only those planning full-time teaching and research careers were in impressive proportion satisfied with the balance of experience in the internship. It is significant that nearly all of the general practice and specialty practice aspirants who were dissatisfied with the internship felt that the emphasis was too practical. It will be remembered that the higher expenditure medical schools produced the greater proportions of "too theoretical" complaints about clerkships, and that these complaints arose primarily from those interested exclusively in the practice of medicine. The more practical internship experience that followed was judged to be well-balanced by the large majority of these people, although for 30 per cent of them it became altogether too practical.

Interns from the less academically oriented low-expenditure schools who are, for the most part, also interested in medical practice careers, tended to be well satisfied with their balance of experience in medical school clerkships, but having already had a good share of relatively practical experience during medical school, a large proportion found the internship too practical. As the reality of full responsibility approaches, the student physicians evidently become more aware of their limitations, of how much they don't know and how much they need to learn, for example, about the application of scientific knowledge to patient care.

When we compare career-plan groups with respect to the kinds of benefits they have derived from the internship, we find additional suggestion of such a trend among all of the practice-oriented groups. In comparison with their peers planning teaching and research careers, these people express less satisfaction with the amount of instruction received in the application of basic science knowledge and likewise with the amount of constructive review and criticism received.

Conclusions

Although high-ability graduates of financially secure medical schools serving internships in good major teaching hospitals are inclined to view their internship experience favorably, we cannot conclude that the present-day internship is serving its function well. The individuals just described are very unlikely to be planning to go directly into practice. They have before them several years of residency training and, likely as not, the internship year serves them as something of a breather. The intern who faces imminently the responsibilities of a career in general practice, however, —and who is not unusually well-endowed intellectually, whose medical school struggled with problems of inadequate finances, and who is serving a rotating internship in a nonteaching hospital—is far less complacent, and evidently with reason. This is not to say that all individuals who fit the latter description are inadequately prepared to launch into their medical careers, for we have no way of determining whether they are or are not. What we can say, however, is that each of these factors represents the less favorable end of a continuum with respect to judgments made by recent medical

school graduates about the values of their clerkship and internship experiences. Lack of the kind of attention needed to produce constructive review and criticism of one's work, lack of instruction in clinical applications of the basic sciences, and a surfeit of low-level practical experience emerge as the most notable inadequacies of present-day internships.

Who is to say whether or not the experiences that the intern thinks are important are, in fact, the ones that will produce the "best" physician? Who, indeed, will venture to define the "best" physician? A good deal of evidence exists to support the view that he is not one, but many different types of individuals who have many different combinations of aptitudes, skills, aspirations, and needs. The likelihood then is that no single internship model would serve adequately for all future physicians. However, specific types of inadequacies need not have a role in any model.

The data in this study tend to support the popular view of the internship as a period of indentured servitude for many young physicians. Where such conditions exist, one is forced to inquire as to the inadequacy of mechanisms for approving internships and to inquire as well into the ethics of demands for service in the guise of fulfilling an educational requirement made by the medical profession.

B. Factors Affecting the Choice of an Internship

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Six factors influencing student choice of an internship are discussed briefly, and some reference is made to attitudes revealed by the survey of 1958-59 interns. These factors are: (1) the student's perception of the meaning and value of various internships; (2) faculty members' perceptions of the value of a straight or a rotating internship and their knowledge and opinions of available programs; (3) the hospital's needs and capabilities, plus staff interest in the teaching function; (4) the National Intern Matching Program (NIMP); (5) accreditation, licensure, and other formal and legal factors; (6) broad sociocultural factors outside the domain of medical education. The attitudes toward internship revealed by the survey are sufficiently negative to indicate some disparity between the ideal and the actual choice of an internship.

THE TREND toward advanced training and specialization, which is highlighted in Chapter 3, Section A, is well recognized in United States medical education. The incidence of medical school faculty members with at least four years of graduate training is another indication of this trend. Figure 2, developed from data gathered as background for the First Institute on Clinical Teaching in 1958, presents curves illustrating the sharp increase in the proportion of medical faculty members who have undertaken four or more years of postgraduate edu-

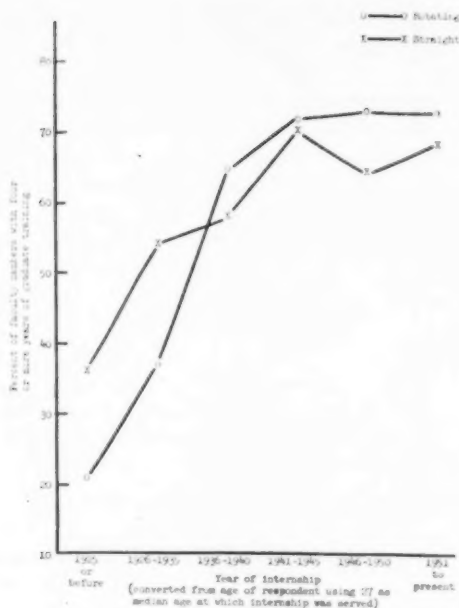


FIG. 2.—Types of internships served by faculty members with four or more years of graduate education.

cation in the 15-year period between 1925 and 1940. This increase reached its asymptote in the early 1940's, when approximately 70 per cent of the 1958 faculty sample (who were then interning) embarked upon four or more years of graduate training.

The two separate curves of Figure 2 indicate that no appreciable difference in this trend toward increased specialized education resulted from the previous decision to accept a rotating as opposed to a straight internship. Possibly the factors affecting choice of type of internship are essentially unrelated to the decision to specialize or to take other advanced study. The geometric progression of the medical sciences would appear to account for the sharp increase in the proportion of physicians taking advanced work, whereas the earlier decision regarding choice of internship appears to depend more on a number of relatively unstable situational determinants.

Wide variability over the years in the proportion of faculty members choosing either straight or rotating internships is demonstrated in Figure 3. To understand the factors that underlie this variability, we should first ask what the parameters of the situation are in which the decision is formulated. We can divide these parameters into six categories:

1. The student's perception of the meaning and value of various internships.
2. Faculty members' perceptions of the value of a straight or a rotating internship and their knowledge and opinions of available programs.

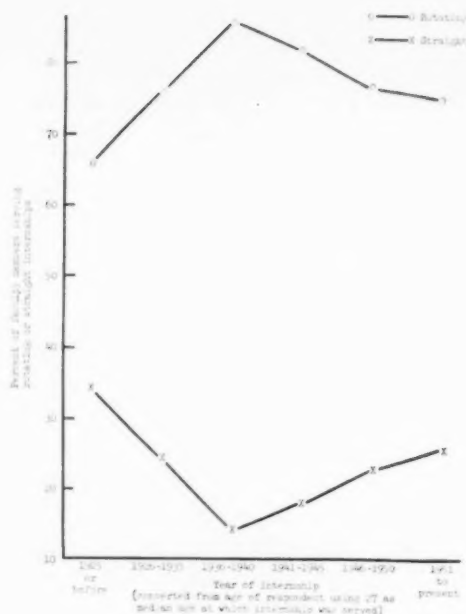


FIG. 3.—Types of internships served by faculty members

3. The hospital's needs and capabilities plus staff interest in the teaching function.
4. The National Intern Matching Program.
5. Accreditation, licensure, and other formal and legal factors.
6. Broad sociocultural factors outside the domain of medical education.

Such a division is arbitrary and somewhat artificial, since the interactions among factors within these categories are as important as the individual factors.

The student's perception of the internship

In the final analysis, the student's perception of the role his internship will play in his subsequent medical career will be a major contributing factor to his final decision. We ask then what points he will consider as he begins to formulate a picture of the kind of internship he wants and what factors will affect his final perception of the meaning and value of any given internship.

If the student is serving his clerkship in a school-affiliated hospital in which he comes into contact with interns and residents fresh from their internships, his perceptions will undoubtedly be colored by the comments of these advanced students. Examples of the types of comments an undergraduate medical student might encounter are presented here. They evidence the manner in which the student's perception of his internship may diverge from the formulation of the "Essentials of an Approved Internship" developed by the Council on Medical

Education and Hospitals of the American Medical Association.¹ These comments have been abstracted from those made by 1958-59 interns in responding to the questionnaire described in Chapter 3, Section A (see Appendix C); they fall into 14 categories. Although the comments summarized here are from those respondents who indicated that their internships had been of little or no value to them, comments made by respondents who generally felt their internships had been of value were nevertheless largely negative in character and fell roughly into the same categories. Of the 133 respondents whose questionnaires were reviewed, 78 wrote additional comments. From these, 151 specific comments were identified and grouped as follows:

CATEGORY 1. Very little or poor teaching (16 per cent of the comments were of this nature)

Examples:

- Teaching here is at a pathetically poor level.
- Little emphasis on critiquing intern.
- No real teaching program.
- Failed to advance the learning process or acquisition of knowledge.

CATEGORY 2. Attendings have no desire to teach or lack the time (9 per cent)

Examples:

- Lack of well-trained men as chiefs.
- Not enough supervision.
- Residents give little or no time to teaching interns.
- Attendings are not well trained.

CATEGORY 3. Too much scut work (18 per cent)

Examples:

- Inconsequential, noneducational administrative duties for the hospital.
- Only purpose of the intern is to take history and physicals.
- Too much time spent covering house and emergency room.

CATEGORY 4. Little or no responsibility for patients (13 per cent)

Examples:

- Little opportunity to do workups on my own.
- Too little patient responsibility, I was a senior med student all over again.
- Staff not willing to trust the intern in assuming any responsibility.
- Lack of responsibility given for medical patients for first 3/4 of the year has seriously blocked my development and maturity as an intern.
- No participation of intern in patient care.

CATEGORY 5. Negative comments on private hospitals and/or patients, physicians (6 per cent)

Examples:

- Served in a private hospital and was a step downward from medical school in most respects.
- I regret taking a private hospital internship! ! !
- Internships should not be a labor substitution for private physicians.
- Too much "nuisance" work on private patients for private physicians with very little interest in offering instruction on the part of private physicians.
- The staff at this hospital is not willing to trust the intern in assuming any responsibility since practically all patients are private.

¹ *JAMA* 155, 1954, p. 1251.

CATEGORY 6. Repeat of senior and junior clerkships (5 per cent)

Examples:

This internship was below the clerkship in both theory and practice.

Medicine and general surgery are almost repeats of senior and junior clerkships.

CATEGORY 7. Internship unprofitable in relation to time put in (5 per cent)

Examples:

The material learned in one year could well have been acquired in a great deal less time.

Long hours of work with limited practical value.

Too much time spent on internship for value received. It has been mainly a year to fulfill licensure requirements.

CATEGORY 8. Limited discussion of cases (3 per cent)

Examples:

Poor attitude of staff with regard to discussion of cases on rounds.

No teaching rounds are held.

Impress that constructive review and criticism for individual cases is a vital part of learning through experience.

CATEGORY 9. Conflict of interests between residents and interns (2 per cent)

Examples:

Residents do the work interns should be doing.

Good training for residents but not for interns.

Duties of an intern at present are encroached upon by student clerks and residents.

CATEGORY 10. Limited training in surgery or other specialties (5 per cent)

Examples:

Poor Ob-Gyn experience.

Failure to provide more than a month in general surgery training.

Intern is allowed to do no surgical procedures.

Surgery performed by untrained general surgeons.

Staff not interested in teaching surgery.

Surgical experience is very limited seemingly on purpose so that GP's will not have sufficient background to do any minor surgery at all.

CATEGORY 11. Inadequacies of hospital administration (3 per cent)

Examples:

Administration primarily concerned with patient's comfort and making money.

Interns just another factor necessary to keep the hospital accredited.

Interns used to satisfy the AMA requirements of a history and physical on each chart.

Poor relations with the affiliated school.

CATEGORY 12. General negative comments with no reason given (6 per cent)

Examples:

On rotating internship: Most disappointing aspect of my medical education.

On straight internship: I would not recommend a straight internship here to anyone.

CATEGORY 13. Contradictory negative comments (6 per cent)

Examples:

Little experience with female and elderly patients. Too many elderly patients admitted for placement in old age homes.

Too many patients to adequately treat, study and to follow up the more interesting ones. Inadequate volume of patients necessary for proper training program.

CATEGORY 14. Miscellaneous negative comments (3 per cent)

Examples:

- Internship contributed little to academic or practical professional skills.
- Little opportunity to attend journal and other conferences.
- Large volume of unnecessary surgery.

It is clear from these comments that the student is likely to perceive the internship as: (1) a continuation of his educational experience, (2) an opportunity to assume increasing responsibility for patient care, and (3) a service only in a somewhat limited manner.

Two related factors that might affect the over-all choice of internships in addition to individual choice, are the reputation a specific type of internship might currently have in any given medical school and the reputation of any specific hospital. In order to see clearly how easily rumor or similar forces such as class leadership might cause variation in the choice of a straight versus a rotating internship, for example, let us look at some background information from The National Intern Matching Program (NIMP). The 1959 Directory of Approved Hospitals participating in the Matching Program shows that one out of every five (or 276) straight internships being offered in the Matching Program are concentrated in four hospitals.² An additional 15 hospitals, or a total of 19 hospitals, offer 55 per cent of the available straight internships. One effect of such a concentration might be to make the total proportion of straight versus rotating internships highly vulnerable to rumor, to the opinions of a few students in a class who may be instrumental as opinion makers, or to other idiosyncratic factors. If, for example, one of the major institutions offering a large number of straight internships has, for one reason or another, an unsuccessful year with its intern program, this might well affect the personal decisions of a relatively large number of students.

**Faculty members' perceptions
of the value of available internship programs**

We can expect a good deal of variation in the extent to which faculty advice will actually affect any student's choice of his internship. Some schools have highly organized internship advisory services, but others may treat the problem very informally or only in response to student inquiry. Regardless of the availability of information from the medical school faculty there will be wide individual differences in the way or degree to which students make use of this information. Simply because the information is available does not mean that it will be well utilized.

In addition, the quality of faculty information can vary for a number of reasons. We have seen from the comments presented above that almost any individual is likely to feel that his own internship had some shortcomings. What one faculty adviser perceives as a shortcoming in a program, however, might

² Johns Hopkins (67), Boston City (78), Bellevue (77), and Duke (54).

actually be regarded in retrospect by a student as one of the strengths of his internship, depending on what he personally wishes to achieve in that year. Finally, there is always the question of whether any individual faculty member's perception is dated, i.e., whether or not the character of the programs with which he is familiar has changed radically since he had experience with them. Although faculty advisory programs remain a sound source of information for the student, any or all of these considerations may limit their utility.

The hospital's needs and capabilities; staff interest in the teaching function

The hospital's needs and capabilities can remotely affect the student's choice of an internship, but the situation today is practically the reverse of what it was 20 years ago. Today there are two internships available for every student ready to intern. This competitive ratio has, in conjunction with the National Intern Matching Program, created a situation in which the probabilities are strongly in favor of a student's interning at the hospital of his choice. How then can the needs and capabilities of the various hospitals affect student choice?

First, through the basic consideration of the proportion of kinds of internship they make available, hospitals place certain limits on the variation of choice among types. Straight internships now constitute 13 per cent of the total available number. Even if all available straight internships were to be filled, less than one-fourth of all students interning could take a straight program. When we consider the variability over the years in the proportion of faculty members taking a straight internship (Figure 3) and the fact that this proportion has been approximately one-fourth or more during four of the six periods plotted, it is apparent that very definite limits on over-all choice result from hospital capabilities. Although this limitation may or may not have played a role in recent years, it will tend to increase in significance at any time other factors might produce a trend toward straight internships.

Other administrative and teaching considerations will also affect the student's ultimate choice. Considerable variation will exist in the criteria that a hospital might set up in ranking potential interns. One hospital may accept only people in the top 5 per cent of their class, whereas another hospital will focus primarily on its administrative and service needs and rank students so as to maximize the probability of getting at least some interns. Finally, the hospital's capability of producing a skilled staff interested in the teaching of clinical practice will undoubtedly remain a major consideration for the student. Any great disparity between a hospital's perception of the internship as a year of service and the student's perception of it as an extension of his medical instruction will, no doubt, affect any mutual agreement adversely.

The National Intern Matching Program

The Matching Program, now starting its ninth year, rather than complicating the problem of choice of internship has served the very useful function of considerably reducing the number of irrelevant factors that come into play. It has eliminated undue pressure on the student from hospitals interested in filling their service needs and has assured him of a broader choice. It has encouraged

a student to specify his true choices without excessive concern about his chances of getting that choice, thereby eliminating a lot of "second guessing." More important, perhaps, is the fact that the NIMP has been able to place all applications on an even footing and, through this, has moved the time of decision much closer to the end of the applicant's schooling. This has had the desirable effect of allowing time for mature, considered judgment in making the final choice.

Formal and legal factors

In addition to the limits hospitals themselves may place on the student's choice, other formal factors come into play to place certain limits on the student's choice of internship. Most significant of these are the requirements of an approved internship set up by the AMA.³ Other significant considerations for the student will be licensure requirements of the state in which he wishes to practice or accreditation requirements if he intends to specialize. In addition, special requirements may govern this choice under special circumstances. Regulations of Selective Service and of the Armed Forces are a case in point. Any of these factors may represent a major consideration in a student's choice or, depending on his individual circumstances, may not be recognized as a limiting factor at all.

Sociocultural factors

Broad social, cultural, or economic factors can play a major role in trends in medical education, even though they exist apart from the milieu of the medical school or the hospital. These factors are numerous and vary in significance over time. Thus, literary stereotypes might during one period be instrumental in the development of a self-concept that the medical student carries throughout his career. If this concept is widespread, it will be reflected in trends that are in turn the result of critical decision points. Such effects can be measured and their results assessed, but a great deal of preliminary work is necessary before such subtle factors can be meaningfully identified.

More striking effects might result from broad economic or cultural changes. We have already alluded to a relationship between the growth of medical science, a cultural factor, and the trend toward specialization. A final illustration might serve to suggest the kinds of factors that would warrant further investigation. Figure 3 shows an apparent trend toward a rotating internship from around 1925 to about 1938 or 1940. This period was one of increasing economic uncertainty. With the onset of the war years and subsequent prosperity the trend reversed, and an increased interest in the straight internship has again been manifested. Perhaps the exigencies of the times drove students to consider a rotating internship as an expeditious route to earning a living in a period when the public could not afford the luxury of a specialist and the young physician could not afford to move immediately into a residency. Or perhaps other factors were more operative. The question can only be answered by physicians who made the decision in those years. As is often the case, our data were unfortunately not collected with this hypothesis in mind.

³ *JAMA*, *op. cit.*

Conclusion

Whether the trends in medical education suggested here are beginning to stabilize or whether they may yet be grossly affected by the variables mentioned, or by other variables not yet recognized, remains a question for discussion.

All of the factors discussed above have been recognized in previous articles, brochures, and statements of policy. However, the fact that a survey of attitudes toward the internship results in a high proportion of negative comments is clear indication of a continuing disparity between theory and practice. It is within these areas where good or poor practice can be clearly recognized that medical education should be able to make rapid strides.

How these and other factors weigh in any individual student's choice of an internship cannot be answered by data presently available. Discussion and refinement of these variables and the submission of additional considerations by those in medical education can serve a useful function to further research.

C. Reanalysis of 1958 Institute Data Pertaining to the Internship

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This analysis is concerned with the types of internship served by clinical faculty members and department heads. It is based on a pre-Institute survey conducted in the spring of 1958. Certain characteristics of faculty members—such as their type of appointment, rank, and type of school at which they are located—are considered in relation to experience and preference. One result is that straight rather than rotating internships were served and desired by full-time faculty members at schools with high Medical College Admission Test averages.

Data are also presented regarding the opinion of faculty members and department heads on combining the internship with the fourth year of medical school. Department heads appear to be more in favor of this curriculum revision than other faculty members, but medicine and surgery heads are less enthusiastic than other department heads.

TYPE OF INTERNSHIP SERVED AND DESIRED BY FACULTY MEMBERS AND DEPARTMENT HEADS OF AMERICAN MEDICAL SCHOOLS

Introduction

THE MOST appropriate type of internship training is an issue being given increasing attention by medical educators. The rotating internship has come under criticism from certain quarters as providing the graduate student with only a smattering of knowledge in a variety of fields. On the other hand, the straight internship has been criticised by many on the grounds that the student

will be prematurely trained in a specialty, a function which should be reserved exclusively for the residency. The authors of *Graduate Medical Education*,¹ published in 1940, held the view that the internship should "... be considered as part of the basic preparation of the student for general practice. In addition, it should provide him with the foundation on which he can, by graduate training, develop a proficiency in a specialty."

The authors apparently favor the rotating internship, for they go on to point out that, should the student who has served a straight internship fail to go on for residency training, he will be ill equipped for general practice—and what is more there is the danger that such a person will attempt to specialize on the basis of his limited training in a particular field. However, at some of the leading medical schools, the sentiment among educators seems to be in favor of the straight internship. One basis for this inference is that the proportion of graduates of these schools who take straight internships is much larger than for the nation as a whole. For instance, in the period 1957–58, fully 90 per cent of all graduates of American medical schools received rotating and mixed internships, but data collected by the Bureau of Applied Social Research show that 52 per cent of recent graduates of a leading Eastern medical school received straight internships.²

In this paper, we examine data collected by the Association of American Medical Colleges in the spring of 1958 on the types of internship served and considered desirable by clinical faculty members and department heads of American medical schools.³ Medical educators set the pace for the profession at large. For this reason it is rather important to know what their own experience in connection with internship has been. By examining the characteristics of physicians affiliated with medical schools, it should be possible to shed some light on the significance of these types of internship for various kinds of medical careers.

The analysis will be based on two questions asked of faculty members and department heads at all medical schools:

1. What type of internship did you serve?
2. In the light of your subsequent career, and if you had complete freedom of choice, which type of internship would you now choose?

The second question will allow us to determine which types of teaching physicians have regrets about the kind of internship they served, and for which types of medical careers the rotating and straight internships are considered desirable.

The analysis will begin with an examination of the type of internship served and desired by faculty members and department heads. We shall then consider certain characteristics of faculty members such as their type of appointment,

¹ A report of the Commission on Graduate Medical Education (Chicago: The University of Chicago Press).

² Kendall, Patricia L., and Selvin, Hanan C., "Tendencies toward Specialization in Medical Training," in *The Student Physician*, edited by R. K. Merton, G. G. Reader, and P. L. Kendall (Cambridge, Massachusetts: Harvard University Press, 1957), p. 165.

³ See *Questionnaire Analyses: Preparatory Material for the 1958 Teaching Institute* (Evanston, Illinois: Association of American Medical Colleges, 1958).

TABLE 3.31
DISTRIBUTION OF FACULTY MEM-
BERS, DEPARTMENT HEADS, AND
RECENT GRADUATES ACCORDING
TO TYPE OF INTER-
SHIP SERVED

Type of intern- ship served	All interns* 1957-58	Clinical faculty	Depart- ment heads
Rotating-mixed	90%	78%	66%
Straight	10	22	34
N	(10,198)	(1776)†	(348)†

* Source of distribution of filled internships in the United States: Council on Medical Education and Hospitals, "Graduate Medical Education in the United States," *Journal of American Medical Association*, 165 (October 5, 1957), p. 454.

† Faculty members and department heads who did not answer the question have been omitted from this table. This has been done in all subsequent tables as well.

rank, and type of school at which they are located, as these bear on their internship experience and preference. Finally, we shall take up certain characteristics of the schools attended by these faculty members which are related to the kind of internship they served.

Type of internship served

Table 3.31 shows the distribution of faculty members and department heads according to the type of internship they served. For comparative purposes, data are also presented on the kind of internship appointments received by all graduates of American medical schools in 1957 and 1958.

For all three groups shown in the table, the rotating or mixed internship is far more popular than the straight internship. However, there are significant differences. Almost all recent graduates received rotating internships.⁴ Among faculty members, the proportion who served straight internships is twice as large as for the recent graduates, and among department heads the straight internship proportion is three times as large. Inasmuch as most recent graduates will never be affiliated with academic institutions once they are in practice, these data indicate that the straight internship is related to a career in academic medicine. Department heads, who are more closely identified with the world of academic medicine than faculty members, are the ones most likely to have served a straight internship. The data to be presented below will provide additional support for this conclusion. However, it should be noted that a straight internship is by no means essential to an academic career, as evidenced by the fact that even among department heads a majority served rotating internships.

⁴ Included here are 2 per cent who took a mixed internship. We shall, for convenience, talk only of rotating internships, although it should be kept in mind that these figures also include some men who served mixed internships. In the AAMC survey these types were not distinguished, although it is safe to assume that the great majority in this category served rotating rather than straight internships.

TABLE 3.32

TYPE OF INTERNSHIP SERVED AND
DESIRED BY FACULTY MEMBERS
AND DEPARTMENT HEADS

Type of internship	Faculty members		Department heads	
	Served	Desired	Served	Desired
Rotating- mixed	78%	78%	66%	58%
Straight	22	21	34	42
N	(1776)	(1837)	(348)	(367)

TABLE 3.33

TYPE OF INTERNSHIP DESIRED BY
FACULTY MEMBERS AND DEPART-
MENT HEADS ACCORDING TO
TYPE OF INTERNSHIP SERVED

Type of internship desired	Faculty members		Department heads	
	Served		Served	
	Rotating	Straight	Rotating	Straight
Rotating	94%	25%	82%	12%
Straight	6	75	18	88
N	(1383)	(378)	(195)	(110)

Type of internship desired in light of subsequent career

In part, the importance of a straight internship to a career in academic medicine can be ascertained directly from the faculty members and department heads themselves. If they were free to make the choice again, which type of internship would they now choose? If a straight internship facilitates a career in academic medicine, we should find that greater proportions of faculty members and department heads wish they had had straight internships than in fact took them. These data are shown in Table 3.32. To facilitate comparisons, the data on type of internship served are repeated.

Within the faculty group, the figures on internship desired are identical with those on internship served. Among faculty members, there is clearly no tendency to think that a straight internship would have been more beneficial to their careers. Among department heads, however, we find that more wish they had had a straight internship than served this kind.

This finding raises the question of how the typical career of faculty members differs from that of department heads. One difference is that almost all of the latter, but only a small minority of the former, are full-time academicians. Most faculty members have either part-time or voluntary appointments, meaning that they devote the bulk of their time to private practice rather than to teaching. Thus if the straight internship is considered more desirable for an academic career, we should expect to find differences among faculty members according to their type of appointment.

Before considering this possibility, attention should be called to a further question raised by the data in Table 3.32. To what extent are faculty members and department heads satisfied with the kind of internship they had? Does the similarity in distributions between internship served and desired mean that all faculty members prefer the kind of internship they served? To answer this question it is necessary to examine the type of internship desired separately for faculty members who took rotating and straight internships. This is done in Table 3.33.

The great majority of faculty members and department heads are satisfied with the type of internship they served. However, those faculty members who served a rotating internship are more likely to be satisfied with their choice than those who served straight internships. Thus 25 per cent of the latter, but only 6 per cent of the former, would change their decision. Among department heads,

TABLE 3.34
TYPE OF INTERNSHIP SERVED AND
DESIRED ACCORDING TO TYPE
OF APPOINTMENT HELD
BY FACULTY MEMBERS

(Per cent who served or desire straight internships)*

Straight internship	Type of appointment		
	Full-time	Part-time	Volunteer
Served	34% (419)	23% (309)	15% (957)
Desired	37 (433)	21 (314)	14 (995)

* The per cent base Ns are shown in parentheses.

the opposite pattern is found: fewer of those who served straight internships have regrets about their experience than those who served a rotating internship. These differences point up more sharply than the previous data the varying significance of a straight internship to faculty members and department heads. The balance of opinion among faculty members who would now change their type of internship is that the rotating internship is more desirable for their careers, but the opposite is true among the department heads who would change their decision.

The significance of type of appointment

The interpretation that straight internships are considered more desirable for the career of the full-time academician finds support from the data presented in Table 3.34. It will be noted that type of appointment is related to both the type of internship served and type of internship desired. The straight internship is most closely associated with having a full-time appointment. As the degree of involvement in academic medicine decreases, so do the proportions having served or now desiring a straight internship. It is of interest that the relationship is somewhat stronger for type of internship desired. The reason for this is that full-time faculty members behave in the same way as the department heads—that is, somewhat more of them wish they had had a straight internship than in fact had one. Among the part-time and volunteer teachers, however, the opposite is true.

These data thus confirm the hypothesis that the straight internship is more characteristic of the full-time academician. Why this should be the case is by no means self-evident. On the one hand, it may be that a straight internship actually provides better preparation for a career in academic medicine; on the other hand, the findings may mean that the merits of a straight internship are best appreciated by full-time men, even though this type of internship is no more suited to the needs of an academic career than is the rotating internship.

Academic rank and internship

One very crude way of testing the possibility that a straight internship increases the chances of success in academic medicine is to consider its relationship to academic rank. Are faculty members who served straight internships more likely to rise to the top of the academic hierarchy? In order to study this, it will

TABLE 3.35
THE RELATIONSHIP BETWEEN ACADEMIC RANK AND
TYPE OF INTERNSHIP SERVED AND DESIRED
PRESENTED SEPARATELY FOR EACH
TYPE OF APPOINTMENT

Type of appointment	Rank of faculty members			
	Full professor	Associate professor	Assistant professor	Instructor
<i>Full-time</i>				
Straight internship served	40%	31%	34%	31%
Straight internship desired	39	41	36	34
<i>Part-time</i>				
Straight internship served	25	16	26	22
Straight internship desired	21	17	28	18
<i>Volunteer</i>				
Straight internship served	17	19	16	15
Straight internship desired	13	17	17	13

be necessary to control for type of appointment, for the data on hand indicate that full-time faculty members are more likely to have higher rank than the others. These data are shown in Table 3.35.

The rows of percentages show the association between straight internship and academic rank. With the possible exception of full-time faculty members, there is no relationship between rank and having served a straight internship. Among full-time men, the full professors are somewhat more likely to have served straight internships than those of lower rank. However, even here the differences are small. Having served a straight internship, then, apparently does not increase chances of rising in the academic hierarchy, especially among part-time and volunteer teachers.

Of some interest are the discrepancies between the two rows of percentages for the full-time men. It will be noticed that among full-time full professors the per cent who would choose a straight internship if they had it to do over again is no greater than the per cent who served straight internships. On every rank level below full professor, however, the net balance between internship served and desired among full-time men is in favor of the straight internship. One might speculate that full-time faculty members who have not yet reached the top of the academic hierarchy are inclined to feel that a straight internship would help their career, for they perceive that their colleagues who are full professors were more likely to have had a straight internship. On the other hand, the full-time men who have reached the top may be less inclined to regret their internship decision, since they have already achieved success in the system.

Quality of school and internship⁵

Earlier we suggested that the straight internship is apt to be favored by educators at the more outstanding medical schools. There are some data on hand that allow us to study the effect of school quality on the internship served and desired by faculty members and department heads. The average MCAT score of

⁵ It should be emphasized that the term "quality" as used here refers only to a school's standing as indicated by its students' average Verbal and Quantitative scores on the Medical College Admission Test at the time data for this survey were collected. No unqualified value judgments are implied, because other indicators of school quality were not taken into consideration. The terminology is the result of semantic expediency.

TABLE 3.36
THE RELATIONSHIP BETWEEN SCHOOL QUALITY AND INTERNSHIP
SERVED AND DESIRED BY FACULTY MEMBERS PRESENTED
FOR EACH TYPE OF APPOINTMENT

(Per cent who served or desire straight internship)*

School quality	Full-time		Part-time		Volunteer	
	Served	Desired	Served	Desired	Served	Desired
First quartile	45% (130)	43% (134)	35% (97)	30% (99)	26% (224)	20% (237)
Second quartile	31 (117)	37 (117)	23 (77)	25 (77)	15 (264)	11 (272)
Third quartile	31 (81)	33 (87)	14 (49)	14 (50)	12 (190)	12 (198)
Fourth quartile	25 (61)	30 (64)	17 (47)	13 (48)	10 (209)	13 (219)

* The per cent base Ns are shown in parentheses.

the entering students at the 80-odd medical schools included in the survey is known. On the assumption that the more talented students are attracted to the better schools, we shall use the average MCAT score of the students as an indicator of school quality. The schools for which this information is available have been classified into quartiles, that is, we distinguish four quality levels of medical schools.

As we shall soon see, the quality of the school at which faculty members and department heads are located is related to the kind of internship they served and now consider desirable. It also turns out, however, that the distribution of faculty members according to type of appointment is not the same in each quality level. The top schools are somewhat more likely to have full-time faculty members than are those in the lowest quartile. The proportion of full-time men in the highest-ranking schools is 29 per cent, and decreases to 19 per cent among schools in the lowest quartile. Thus, in order to show the effect of quality of school, it will be necessary to separate faculty members according to type of appointment.

The effect of school quality, irrespective of type of appointment, can be seen by reading down each column of percentages in Table 3.36. As school quality decreases, so does the per cent of respondents reporting that they served straight internships. A similar pattern appears for the type of internship desired. Taken together, quality of school and type of appointment account for a good deal of the variation in type of internship served and desired by faculty members. Thus, almost half of the full-time men at schools in the top quartile served straight internships, but only 10 per cent of the volunteer faculty at schools in the lowest quartile did.

An interesting finding emerges when we compare the figures on internship served and desired on each level of quality and for each type of appointment. By reading across the top row it will be noticed that in the highest-quality schools, where straight internships are most common, the per cent desiring straight internships is somewhat smaller than the per cent who served this kind of internship. This holds true even for the full-time faculty members in the high-quality schools. On every other quality level this consistent pattern is not found. For example, in the second quality level the discrepancy between served and desired is in favor of straight internships for both the full-time and part-time men, and on the lowest-quality level the balance in favor of straight internships holds for full-time and volunteer faculty members.

TABLE 3.37
THE RELATIONSHIP BETWEEN
SCHOOL QUALITY AND INTER-
SHIP SERVED AND DESIRED
BY FACULTY MEMBERS*

School quality	Straight internship	
	Served	Desired
First quartile	33% (478)	29% (497)
Second quartile	21 (478)	21 (487)
Third quartile	17 (340)	18 (356)
Fourth quartile	14 (335)	17 (349)

* The per base Ns are shown in parentheses.

TABLE 3.38
THE RELATIONSHIP BETWEEN
SCHOOL QUALITY AND INTER-
SHIP SERVED AND DESIRED
BY DEPARTMENT HEADS*

School quality	Straight internship	
	Served	Desired
First quartile	48% (63)	67% (72)
Second quartile	40 (83)	46 (85)
Third quartile	33 (78)	39 (80)
Fourth quartile	26 (84)	32 (87)

* The per cent base Ns are shown in parentheses.

One might speculate from this tendency to regret straight internships in the highest-quality group that the authorities who recruit faculty members at these schools give more weight to a straight internship than the faculty members themselves feel should be given to it. Perhaps in obtaining a position at a high-quality school it helps to have served a straight internship, but the faculty members themselves, when they review their careers, are not at all sure that this kind of internship is most useful to them.

That the straight internship is more related to the recruitment of faculty members at high-quality schools than to the faculty members' own judgment as to its value is evidenced by the fact that the relationship to quality is stronger for internship served than for internship desired. This can be seen more easily in Table 3.37, where the distinction between faculty members of different types of appointment is ignored. Reading down the column of figures for internship served, we see that there is a difference of 19 percentage points between the highest- and lowest-quality groups; for internship desired, the difference is 12 percentage points.

The effect of school quality on the internship served and desired by department heads

Presumably department heads play an important role in the recruitment of faculty members. If we are correct in assuming that even at high-quality schools there is a discrepancy between the opinions of faculty members and higher authorities as to the value of a straight internship, we should find that for department heads the net change between internship served and desired is in the direction of the straight internship, especially at the high-quality schools. Table 3.38 shows the effect of school quality on the internship served and desired by department heads.

Among department heads, school quality is positively related to both having served a straight internship and considering it desirable. Moreover, contrary to the faculty pattern, the relationship is stronger for internship desired than for internship served. It will also be noted that on each quality level—and, as we predicted, especially on the highest—the proportion desiring a straight internship exceeds the proportion who actually served straight internships.

The effect of quality of school on the cleavage between faculty members and department heads as to the value of straight internships can be seen more clearly from Table 3.39, which combines the data of Tables 3.37 and 3.38. When the

TABLE 3.39
THE EFFECT OF SCHOOL QUALITY
ON THE INTERNSHIPS SERVED
AND DESIRED BY FACULTY
MEMBERS AND DEPART-
MENT HEADS

Group	Quality of school			
	1st	2nd	3rd	4th
<i>Straight internship served</i>				
Department head	48%	40%	35%	26%
Faculty	33	21	17	14
Discrepancy	15	19	18	12
<i>Straight internship desired</i>				
Department head	67	46	39	32
Faculty	29	21	18	17
Discrepancy	38	25	21	15

percentage differences between faculty members and department heads for internship served and desired are compared, it is noted that on each quality level the discrepancy between faculty members and department heads is greater for internship desired than for internship actually served. In other words, department heads and faculty members at schools of all quality levels are more alike in terms of the kind of internship they actually served than in terms of their opinions on the most desirable type of internship for their careers. The second thing to be noticed is that quality of school has little effect on the difference in actual experience between department heads and faculty members. The discrepancy between the two groups on internship served does not change in any consistent way with quality of school. On the other hand, quality of school does make a difference between department heads and faculty members with respect to internship preference. As quality of school increases, the gap in opinion between faculty members and department heads widens—from a 15 per cent discrepancy in the low-quality schools to a 38 per cent discrepancy in the highest.

The data presented so far have enabled us to locate those segments of medical educators in favor of straight internships. In general, those who are most committed to a career in academic medicine and those located at the higher-quality schools are the ones most likely to have served and to prefer now a straight internship. Thus, department heads are more likely to endorse the straight internship than faculty members. Among faculty members, those with full-time appointments are more in favor of straight internships, and in both groups those at the high-quality schools tend to have this preference. It should always be remembered, however, that in almost every instance a *majority* of faculty members and department heads were found to favor the rotating internship. The findings on straight internship only reflect differences in the size of the minority group. The one exception consists of the department heads in the highest-quality schools. For this one group of educators we find that a sizable majority—fully two-thirds—prefers the straight internship.

The apparently strong commitment of department heads at the higher-quality

TABLE 3.40
TYPE OF CONTROL OF
MEDICAL SCHOOL AT-
TENDED AS RELATED
TO TYPE OF IN-
TERNSHIP
SERVED

Type of internship	Tax- supported	Private
Rotating-mixed	93%	71%
Straight	7	29
N	(594)	(1575)

ity schools to the straight internship provides a clue to the dynamics underlying the empirical findings. It is quite likely that these men encourage their graduates, especially the more outstanding students, to take straight internships. It is these outstanding graduates of the better schools who are most likely to enter academic medicine; full-time academicians, especially, are likely to be recruited from their ranks. The more outstanding medical schools, in turn, are better able to compete for the more outstanding recruits to academic medicine, and consequently they are more likely to recruit those physicians who have served straight internships. Such a reconstruction of the process goes a long way toward accounting for many of the empirical findings.

What is not fully understood, of course, is why department heads at the better medical schools are committed to the straight internship. The data presented above tend to show that faculty members do not share this enthusiasm of their department heads. Even among full-time men at the schools in the top quartile we find a majority still favoring the rotating internship; among these men, the proportion preferring a straight internship does not exceed the proportion who served this kind of internship (in fact, as we have pointed out, the proportion is slightly smaller). Moreover, it has been shown that serving a straight internship is not closely related to the position of faculty members in the academic hierarchy.

**Some characteristics of the schools attended
by faculty members which affect type of internship**

Until now we have been concerned with the subsequent careers of faculty members who served straight and rotating internships. We should also consider whether the type of internship one serves is influenced by the type of school from which he was graduated. There are some data on hand that show this is indeed the case. A particularly important factor is whether the faculty member attended a tax-supported or private school. As can be seen from Table 3.40, virtually all the graduates of tax-supported schools served rotating internships. There is a simple explanation for this circumstance—graduates of many tax-supported schools are required by law to take rotating internships.

Another characteristic of the undergraduate medical college related to the type of internship served turns out to be geographical region. There is com-

TABLE 3.41
TYPE OF INTERNSHIP SERVED AC-
CORDING TO REGION OF MEDICAL
SCHOOL ATTENDED FOR FAC-
ULTY MEMBERS WHO AT-
TENDED PRIVATE
SCHOOLS ONLY

Type of internship	Region of medical school				
	South- east	North- east	South central	North central	West
Rotating- mixed	61%	62%	74%	88%	89%
Straight	39	38	26	12	11
N	(125)	(496)	(81)	(237)	(55)

paratively little variation by region for graduates of tax-supported schools and thus Table 3.41 deals only with graduates of private medical schools. Although a majority of the faculty members who attended schools in each region served rotating internships, the data show that those who graduated from private Eastern schools were more likely to take a straight internship than those who attended schools in other regions.

This information rounds out the picture of the different careers of faculty members who served rotating and straight internships. We now know that the men who served straight internships were likely to have graduated from private Eastern schools. And, as we have seen, recipients of straight internships tend to end up as full-time faculty members at the better medical schools. Although we do not have the data on quality of medical schools according to region, it would not be surprising if the schools which attract outstanding students tend to be located in the East. We know that the highly influential department heads at such schools favor the straight internship, which might explain why graduates of these schools tend to seek straight internships. Why this kind of internship finds its strongest advocates among department heads of high-quality, and presumably Eastern, schools is a question which must lie beyond the scope of the present paper.

OPINION OF PROPOSAL TO COMBINE INTERNSHIP AND UNDERGRADUATE TRAINING INTO FOUR-YEAR PROGRAM

The value of the internship as a learning experience has been seriously questioned by many medical educators. They point out that the present internship arrangement in many hospitals all too frequently emphasizes service and provides little in the way of education for the newly graduated medical student. Some medical educators have even suggested that it would be desirable to do away with the internship entirely and instead provide undergraduates with more intensive in-service training.⁶

The 1958 survey of clinical faculty members and department heads con-

⁶ Some comments on the fourth year of medical school and the internship are given in Part II, Chapter 4.

TABLE 3.42
REACTIONS OF FACULTY MEMBERS
AND DEPARTMENT HEADS TO PRO-
POSAL OF COMBINING INTER-
SHIP AND MEDICAL SCHOOL
INTO A FOUR-YEAR
PROGRAM

Opinion	Faculty members	Department heads
Strongly advocate	13%	16%
Advocate	22	30
No opinion	16	13
Oppose	34	27
Strongly oppose	15	14
N	(1919)	(366)

TABLE 3.43
WILLINGNESS OF FACULTY MEM-
BERS AND DEPARTMENT HEADS
TO PARTICIPATE IN NEW
FOUR-YEAR PROGRAM

Opinion	Faculty members	Department heads
Would participate willingly	85%	79%
Would participate reluctantly	11	13
Would oppose the experiment	4	8
N	(1890)	(356)

ducted by the Association of American Medical Colleges included a question on this important and radical proposal. The participants in the survey were asked: "Some medical educators have proposed that the present four years of medical school and the year of internship could be redesigned into a new four-year program. To what extent do you advocate or oppose this proposal?" The response categories to this question were: strongly advocate, advocate, no opinion, oppose, and strongly oppose. In addition, everyone was asked to indicate how willing he would be to participate in such a program apart from his opinion of it.

As can be seen from Table 3.42, opinion on this program is rather sharply divided both among faculty members and department heads. In neither group do we find many who hold particularly strong opinions on this issue. By combining the two advocate and two opposed groups, we find that among faculty members, 35 per cent favor the idea, 49 per cent are opposed, and another 16 per cent have no opinion one way or the other. Department heads as a group tend to be more favorable to the proposal than faculty members. Almost half the department heads think this proposal is a good idea, and a somewhat smaller proportion would oppose it. Since they are closer to the problems of medical education than most faculty members, department heads are probably more aware of the abuses under the current internship arrangement and more concerned with rectifying the situation.

Interestingly enough, quite apart from their opinion of the proposal, most faculty members and department heads report they would willingly participate if such an experiment were undertaken at their school. This is shown in Table 3.43. It will be noted that department heads, in spite of their somewhat greater tendency to approve of the idea, are somewhat less likely to say they would participate willingly than are faculty members. The department heads who are opposed to the idea tend to hold to their opinion more strongly than do the faculty members, or at least they indicate a greater consistency between their opinion and behavior. Thus, among faculty members who say they oppose the program, 77 per cent report that they would participate willingly; among department heads, the comparable figure is 54 per cent. Of those who strongly oppose, 58 per cent of the faculty members would participate willingly, but only 48 per cent of the department heads would.

Since the proposal to combine the internship with the undergraduate pro-

TABLE 3.44
OPINION OF THE PROPOSAL AC-
CORDING TO THE TYPE OF AP-
POINTMENT OF FACULTY
MEMBERS

Opinion	Full-time	Part-time	Volunteer
Advocate plan	34%	37%	35%
No opinion	16	14	19
Oppose	50	49	46
N	(449)	(288)	(961)

TABLE 3.45
OPINION OF THE PROPOSAL ACCORDING TO THE
QUALITY OF SCHOOLS AT WHICH FACULTY MEM-
BERS AND DEPARTMENT HEADS ARE LOCATED
(Per cent who would advocate plan)

Group	School quality			
	1st quartile	2nd quartile	3rd quartile	4th quartile
Faculty members	36% (472)	34% (471)	39% (336)	34% (334)
Department heads	45 (60)	56 (77)	53 (76)	45 (78)

* Per cent base Ns are shown in parentheses.

gram has many supporters and opponents, both among faculty members and department heads, it would be of interest to know which kinds of educators in both groups tend to hold one or the other opinion of the plan. Unfortunately this question is more easily raised than answered. A number of characteristics of faculty members and department heads were related to their opinions of the program, and the results were largely negative. For example, since department heads were more inclined to favor the plan than faculty members, we expected to find that faculty members with full-time appointments would be more favorable to the proposal than other faculty members. But as Table 3.44 shows, this is not the case.

Full-time academicians are no more likely to favor the plan than the part-time or volunteer staff; in fact, the last line suggests that they are slightly more opposed to the proposal. The academic rank of faculty members was also found to be unrelated to opinion of the program. From 34 per cent to 38 per cent of the men on each rank level are in favor of the plan, the 38 per cent representing assistant professors, the 34 per cent, instructors.

Although it was found that quality of school, as measured by the average MCAT scores of students, was related to the kind of internship preferred by faculty members, there is no consistent relationship between school quality and opinion of the four-year program. This can be seen from Table 3.45, which presents data on the proportion of faculty members and department heads who approve of the idea according to the quality of the schools at which they are located.

In spite of the absence of a relationship with school quality, there does seem to be a slight relationship between favoring the proposal and preferring a straight internship, as shown in Table 3.46. Both among faculty members

TABLE 3.46
OPINION OF THE PROGRAM ACCORDING TO
WHETHER FACULTY MEMBERS AND DEPART-
MENT HEADS HAVE A PREFERENCE FOR A
ROTATING OR STRAIGHT INTERNSHIP

Opinion	Faculty preference		Department head preference	
	Rotating	Straight	Rotating	Straight
Advocate four-year plan	34%	40%	45%	54%
No opinion	16	14	12	12
Opposed	50	46	43	34
N	(1423)	(389)	(170)	(137)

TABLE 3.47
OPINION OF THE PROPOSAL ACCORDING TO THE FIELD
OF THE DEPARTMENT HEADS

Opinion of proposal	Department					
	Ob-Gyne.	Pediatrics	Prev. Med.	Psychiatry	Medicine	Surgery
Advocate	63%	50%	47%	39%	37%	33%
No opinion	1	12	20	21	15	9
Oppose	36	38	33	40	48	48
N	(66)	(68)	(46)	(62)	(72)	(51)

and department heads, those who prefer a straight internship are slightly more likely to approve of the combined program, but the differences are small.

It is perhaps of some interest to those concerned with this issue to know the opinions of the heads of the various clinical departments. As Table 3.47 shows, there is a good deal of variation in opinion according to department. It will be noted that the heads of the two largest and perhaps most powerful departments, medicine and surgery, are least likely to favor the combined four-year program.

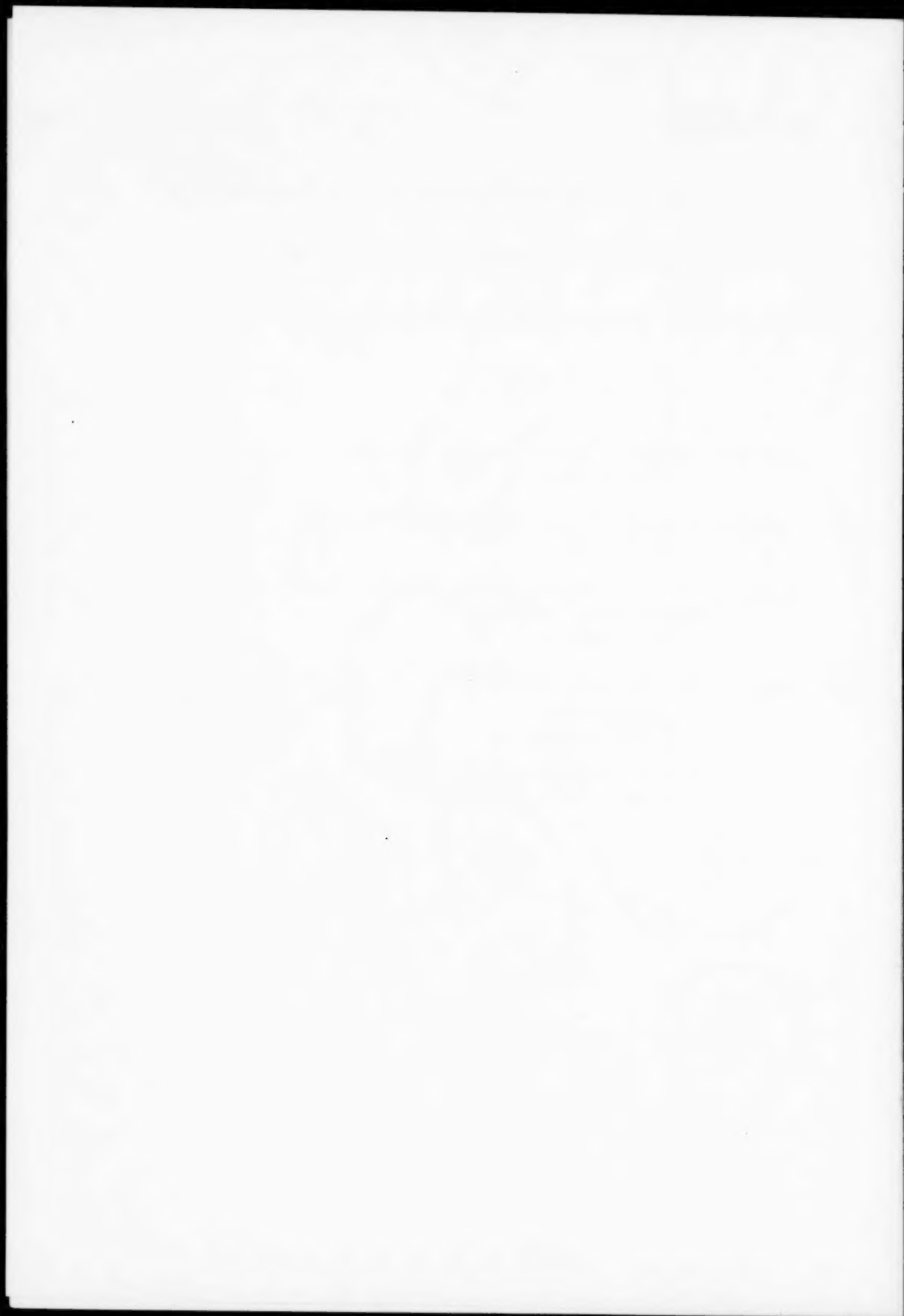
In sum, the plan to revise the curriculum so that the internship is included with the undergraduate program has a large number of advocates as well as opponents among medical educators. Significantly, the leaders among medical educators, the department heads, are more in favor of the idea than are faculty members. Should such a program be introduced, the great majority of both faculty members and department heads have indicated that they would willingly participate. One factor to be taken into account by those who advocate the proposal is that the heads of the most influential departments, medicine and surgery, are least convinced of the merits of the plan.



PART II

The Roles of the University and Examining Boards in the Education of Medical Students, Interns, and Residents

	PAGE
Chapter 4. <i>Teaching and Learning Before the Internship</i>	85
by Eugene A. Stead, Jr.	
Chapter 5. <i>Postgraduate Schools and House-Officer Education</i>	89
by John G. Darley	
Chapter 6. <i>The Role of Examining Boards in Medical Education and in Qualification for Clinical Practice</i>	94
by John P. Hubbard	
Chapter 7. <i>Two Views of the Specialty Boards</i>	103
A. <i>A Surgeon's View</i>	103
by John H. Gibbon, Jr.	
B. <i>A Radiologist's View</i>	108
by Leo G. Rigler	



CHAPTER 4

Teaching and Learning Before the Internship

BY EUGENE A. STEAD, JR.

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Duke University School of Medicine*

Concerning the curriculum: During the first two years of medical school, a fund of basic medical science knowledge is accumulated. The varieties of subject matter are not, however, readily related until all have been covered. The third year is devoted to gaining a practical background of information about hospital operational procedures, techniques of history-taking, physical examination, laboratory testing, etc. The fourth year should be a year for reviewing basic sciences and synthesizing clinical with basic science sources of information. Then, during the internship, the student may develop efficiency with respect to selecting, weighing, and judging information and acting on decisions.

Concerning teaching methodology: Guiding the student through the processes of collecting information, identifying the patient's problems, and seeking out and applying accumulated knowledge about the problem in deciding on a course of treatment is a technique of teaching that is preferable to the lecture. The average student does not learn the basic sciences until he has this opportunity to manipulate them in solving problems of diagnosis and treatment.

BRIEFLY MY comments will be concerned with these three features of medical curricula and teaching methodology: (1) the fourth year in medical schools, (2) the lecture system in teaching, and (3) the timing of the learning of basic science material.

The fourth year vs. the internship

First, let us look at our medical schools. The student enters school, and during his first two years he learns a certain body of knowledge and a certain way of communicating about this knowledge. He learns it relatively rapidly and he has little chance to use or manipulate it. He has little opportunity to relate what he learns first to what he learns later because he has to have covered all of it before he can relate the parts to the whole.

Then comes the third year and it too is spent in learning communication and language. The student has to learn his way around the hospital, how to examine the patient and get data from him; he has to meet the patient's family. In other words, at this point he has to convert the laboratory experiences of his first two years into some sort of mechanical usefulness. In this third year his learning is

extraordinarily limited in scope because he still does not yet know enough to learn on his own.

This student goes to medical school, if he means to become a physician eventually, primarily to be a senior student. The fourth year can be the contemplative year of medical school. This is a year of medical education that should be quite unlike the internship.

What I say about this fourth year is applicable only to those schools and those particular portions of schools that really use the senior year to give the student the opportunity to relate all the material of his first three years. The student can be given a load of clinical work that by no means absorbs all of his time. This load should not vary with the number of students assigned to the service. It should be a load of work that is fixed for a particular individual and purpose. The student can be given a text once or twice a week that he can open and read. Here is the opportunity to go back and reread biochemistry, physiology, and pathology. It is the time and opportunity for synthesis.

Now let us pass to the intern year. The intern year, in my belief, is quite a different year. This is a year of practical experience in training the reflexes of a physician. When given a clinical problem, the young M.D. works it out rapidly in terms of what is important and what should be done, and then goes ahead and does it.

In his fourth year, when he worked up a patient, he worked him up levelly. He spent as much time on the family history of one patient as he did on the next; he spent as much time on the social history of one patient as the next. In short, he made no selection at all because this was his year to observe leisurely how people become sick and how sick people behave. He wanted to look at the individual and learn all he could in regard to the various approaches to the patient.

But the internship is different from the fourth year. In the intern year the student has to learn what is clinically important and useful for the immediate problem. He has to be given such a big load of work that he no longer is able to work in the same level fashion as before; he has to vary the amount of time he spends on any history, physical examination, or laboratory work depending on the problem. The kinds of learning he does in this year—selecting, weighing, judging, acting—are widely different from the kinds of learning he does in his fourth year. In that portion of medical teaching for which I am responsible, the internship will not be melded with the fourth year because I do not believe they serve the same purpose.

The lecture method of teaching

Now a word about lectures, because I believe this is an ineffective method of teaching. Since I have a captive audience here at the Institute, and since I have the opportunity to demonstrate how ineffective a lecture actually is, I do not wish to miss my chance. I am now in the process of giving a lecture and I think that the majority of the people in my audience are not going to hear what I say. When I have finished, in spite of my attempt to use this method of teaching effectively, I will discover it has not been effective and that you actually have not learned.

My lecture is concerned with the uselessness of lectures, and I would just like to demonstrate the difference in methodology. You can give a lecture before a big audience or you can give it to a single student in regard to a single patient. You can give lectures in big rooms or little rooms; you can lecture at the bedside or in the dining room.

But let us think what nonlecture teaching is and what the difference is between the two methods. The difference has to do with whether the instructor talks, which is a lecture, or whether the student talks, which results in a different kind of teaching. I think the second kind is the more effective.

This is how one goes about it. The student has talked to a patient and examined him, and the next thing he needs to do is to find what the problem is that must be faced if the patient is to receive effective care. The teacher finds that the student has not thought about the problem this way and does not know for sure what it is. If you—the teacher—are in a hurry or have had a bad day, you may just tell the student what the problem is. But usually you say, "Let's think about it together," and you finally find at what level he has a solid piece of information. Then you begin to let him build up from this base—he can call on his colleagues or do it any way he wishes—until he finally reaches the level where he can define the problem. Now you can say, "What do you know about it?" He tells you what he knows and you can find out what the rest of the students know about it; at the end you can say, "I have some specific knowledge and I will put it in here." Then you can stop and examine what is known about the problem, but the group at hand does not have all of the necessary information. We are just not smart enough today, so the problem is split up for the students to take away, and you take part of it. Then you say, "Tomorrow we will go back into this in the light of what we should have known if we had just been smart enough." So, everybody takes his piece of the problem, and the next day everybody is smart. Then finally you may go one step further. "Now," you say, "we can pretty well state what is known about this problem. Let's think what *could* be known. Let's think what could be learned if techniques available in this exciting world of ours were applied to this problem." And then you think about medicine of the future. This is the nonlecture method of teaching.

Actually, a lecture can *define* an area of learning. It can say that there are exciting things going on in a certain area and that the student ought to go and look into them. But a lecture won't *teach* anyone these things. It just says that some people have this knowledge and if one wants to work one can acquire the knowledge too.

The learning of basic sciences

This brings me back to the question of when the physician learns his basic science. Nearly all medical students intend to be practicing physicians. Their real goal is to practice medicine and take care of people. They think they learn most of their basic science in their clinical years, and this of course is exactly what you would expect because it is during his clinical years that the student himself gets to manipulate the situations he has covered in theory earlier, and it is the clinical years that give him the stimulus to go back and reread what he read before. The

average student will learn most of the science that he takes out of medical school in his clinical years. He will have learned it by rereading it and by working with it. These are the only ways that knowledge can be made a part of the student's own being.

Besides the average students, we have another group—and these are increasing in number at our school—those who are really not intending to go immediately into practice, those for whom the simple applied use of the healing art is not the prime ambition. You will find that these people come with an entirely different kind of knowledge of basic science. Many have already taken advanced work in some field of the natural sciences. These students are not dependent on their fourth year for synthesis. They have been working out problems in the basic sciences as they went along. For them, new knowledge is used as it is acquired. You will find that these students are interested in learning beyond the level of the average M.D. in ordinary practice. They will learn and will continue to learn their basic science predominantly from the basic science areas themselves.

In summary, learning always occurs when knowledge is taken from the theoretical, when it is taken away from the lecturer, and when it is actually handled, used, manipulated, tasted, and thrown into the air and caught—all the things a small boy does with a new marble. When you use knowledge this way, it belongs to you.

CHAPTER 5

Postgraduate Schools and House-Officer Education

BY JOHN G. DARLEY

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Although the faculties and administrators of medical schools carry the medical tradition, the practitioners are the ones who shape and enforce the current image of medical practice. This fact alone has implications for education, but further complication is introduced by specialty board usurpation of the incentive system in postgraduate education. Circumstances like these are products of the evolution of a profession. The important question is: can medical education escape from the folds of its own history? Can the really small percentage of academically oriented postgraduate students be identified, cherished, and appropriately rewarded?

MY THESIS TODAY may be simply stated: the medical specialty boards have usurped the incentive system for postgraduate medical education, but these same boards are unequipped to discharge the educational function or to foster this function, which properly belongs in postgraduate programs.

Let me set forth some of my credentials for making that conclusion. I have spent over ten years as an administrator in the University of Minnesota Graduate School, a monolithic program encompassing a total of almost 100 degree-granting fields beyond the bachelor's or first professional degree. The graduate enrollment at Minnesota came, in my time, to include 3,600 students in residence as of the second week of the fall quarter and more than 6,000 within a full calendar year. This experience permits a comparison of the way various disciplines handle their problems of postgraduate education.

There are, I think, a distinguished hospital and medical school at the University of Minnesota, in combination with the Mayo Clinic and the Mayo Foundation for Graduate Medical Education and Research which are also under the general administrative aegis of the Graduate School on the Minneapolis campus. Perhaps my credentials should include the fact that some of my best friends are doctors on these faculties.

External to my service at Minnesota, I have been since 1952 chairman of the committee on relations with psychiatry of the American Psychological Association, and I was the APA's delegate to a meeting in April 1959—the then-named Joint Commission of the American Medical Association on Paramedical Specialties.

If my audience will accept these credentials, let me then try to elaborate on

my thesis regarding the displacement of the university's function with respect to incentives for postgraduate medical education.

Illusion vs. reality

During my period of service at Minnesota, I observed the thundering antipathy of most residents and medical fellows to the requirement of being registered in the Graduate School. With a few brilliant exceptions, they were averse not only to the procedures but, quite often, to the philosophies of the Graduate School.

In relation to the total number of residents and medical fellows in the various clinical specialties, we were always concerned with the small proportion who attained the master of science degree in the clinical specialty, a three-year degree with thesis, or the Ph.D. in the clinical specialty, a four-year degree with thesis. Quite often we sought to elucidate this relationship by comparing the Mayo graduate group with the Minneapolis graduate group. This did not elucidate the problem nor solve it. It did, however, reveal interesting differences between two medical faculties. We continued to be unclear as to what the small proportion of degrees achieved really meant in terms of the goals of medical graduate education as our Graduate School—like all graduate schools—undertook to define them.

I was impressed quite early with the illusion of graduate-degree candidacy in contrast with the reality of the specialty boards' requirements of three years or more of supervised experience. Furthermore, I am sure those in medical education recognize far better than I the labor problems involved in running a major hospital, teaching or otherwise, without the low-paid help of interns and residents. This is a problem that has dogged not only medicine but other professional groups. It presently affects my own field as we use internship years in more and more of the training installations for clinical psychologists and psychologists in other specialties.

I was always interested, during the experience of my ten years, in the place of the basic sciences in residency training. The problem was solved at Minnesota—if it is solved at all—by the insistence that every graduate-degree candidate in a clinical specialty major take a minor in one of the basic sciences. This put us in an interesting position in our own graduate school. We understood the validity of this. It was an attempt to be sure that the well-trained clinical specialist would not have forgotten the basic sciences. But, even though it was inescapable, this minor requirement also complicated the medical fellow's incentive problem: "Why am I taking this, in terms of what the specialty board will hold me to?"

We thought one time of simplifying the administration of our Graduate School at Minnesota by conforming to the procedures of the majority of the members of the Association of Graduate Schools. Most of these schools do not use the minor field of study as a requirement for the Ph.D. But we found that if we conformed to the practices of most of the leading graduate schools, we would do some damage to the medical degrees given at Minnesota. If the required minor in the basic science were removed, there was a feeling, something like Gresham's

law of bad money driving out good money, that medical fellows would neglect the basic sciences in favor of even more concentration on their clinical specialty with an eye to the board requirements.

I was concerned with this problem because of the changing character and rapid advances in all the basic sciences on which clinical practice depends. With some real effort, based on a very limited course in physiology, I had once undertaken to understand the anatomy of the middle ear so that I could hopefully referee an argument between a member of the anatomy department and one of his students, only to find that the anatomist was being replaced by a protein chemist, which left me with a somewhat different perception of anatomy!

As the nature of the basic sciences changes, how does this impact get transmitted to the clinical students in postgraduate work in medicine who need to know it?

I was constantly impressed by the lack of meaning of academic grades in the graduate medical enterprise. My staff and I checked consistently the grade records of all graduate students, but I excluded from this check the grades of graduate medical students. They all seemed to get A's. This may very well be due to the high quality of medical graduate students, but I have reason to doubt this, since not all of them succeeded in passing the specialty board examinations.

An outsider's solution

As an outsider to this educational culture, I had a rather naïve solution. I suggested that we give good-conduct medals to the bulk of the residents, and that we do this at some point in their residency training when it became quite clear that the ideals of graduate schools did not motivate these people.

Understand, I have no reason whatsoever to believe that medical specialization is weakened by the nature of the specialty board enterprise. But, I do believe that graduate-school education is weakened by it. I believe, as I said at the beginning, that the specialty boards substitute their pattern of incentives for the pattern of incentives of true graduate study, although I recognize at once that true graduate study is not easy to define. Nor is medicine the only profession guilty of having prostituted it. Many other disciplines have done so; medical education need not feel greater guilt than any other group, including engineering, in this regard. I might add, too, that all graduate-school administrators have their own touch of paranoia; it is an occupational disease. Every special field demands that its own professional needs be satisfied by the university.

Now, if we could give a good-conduct medal—in other words, a certificate of attendance and no more—this then could be presented to the specialty board to say, in effect, "I have served my time." The residents and fellows would have been supervised by board-certified men, which is required by the specialty boards; they would have lowered their own threshold of anxiety somewhat by being held to one set of standards and not artificially to two.

After all graduate medical students have been in residence for at least a year, one might, even with our imperfect selection devices, cut out of this herd those who are really motivated for academic careers and make them graduate students in the best meaning of the term. Full respect might thus be accorded the idealism

and the philosophy that motivate graduate schools, admittedly imperfectly, in the areas of research and scholarly activities.

Why won't this naïve solution work? My friends in medicine listened to it in fascination and then went on to talk of other things. I think it is true that we in the professions may get caught up and smothered in the folds of our own history. If there is any advantage in listening to an outsider, it is that he may see at what point the evolution and history of the profession does enshroud one in the folds.

Certainly the history of American medicine is a great and distinguished contribution to professional development. Who are the carriers of the medical tradition? The carriers of the great tradition are the faculties and the administrators of medical schools. But who are the enforcers of the current image of medical practice? The enforcers and shapers of the image are the practitioners, not the faculties of the medical schools. The public press aids in shaping this image and the economics of specialty practice contribute to it. The motives and incentives of the students who arrive with an image of what medicine will be like, probably lean toward the practitioner model.

I suggested at the 1956 Teaching Institute that one cannot take a young man from the upper socioeconomic classes into the long grind of medical education, withhold economic rewards for a long period, and then expect him to be indifferent to making up economically for the lost years.¹ A career of scholarship and research at that point cannot appear attractive.

The problem here is: how can the faculty impose its image on a group of students who hold another image and hold it in spite of the indoctrination that medical education attempts? To this problem of basic professional training the medical specialty boards add a new dimension. The profession has gone beyond the quite proper basic control of the M.D. degree by state licensure and moved on to the control of the specialty and the encouragement of specialty education. This becomes a part of medicine's professional history that makes the job of teaching postgraduate medical education in a real sense a difficult assignment for graduate schools.

After reading the special reports in the *1959 Teaching Institute Workbook*,² I felt uncomfortably as if I were reading George Orwell's *The Animal Farm*: all animals are created equal but some are more equal than others. The differential quality with respect to medical schools seems to have three dimensions: the ability level of the student is mentioned as one differential quality index; gross expenditure by the school is another; the third is the career-choice pattern of the students and the extent to which they choose specialty practice as against general practice. These are some of the dimensions that appear in the reports as qualitative differentials, related to the issues of postgraduate education. (See Chapter 3.)

For example, the internship seems to give experience but not education. This

¹ Darley, John G. "Over-all Appraisal of the Admissions Process," in *The Appraisal of Applicants to Medical Schools*, edited by Helen Gee and John T. Cowles (Evanston, Illinois: Association of American Medical Colleges, 1957), p. 180.

² Based on pre-Institute research and published by the Association of American Medical Colleges for distribution to Institute participants.

is one of the things that the 1958-59 sample of students says. And the better students, working in good institutions with good resources and with high aspirations for research and academic careers, seem to respond better to what little education they get in the internship.

A sample of 1950 graduates, now practicing physicians, seems to say that observation was the way of learning in medical school and trial and error thereafter. Understandably, as a potential patient, this tends to leave me a little chilled. I wonder at this point whatever happened to teaching, if trial and error is the way a physician finishes his education. Am I likely to be one of the trials or errors?

In conclusion

Can you in medical education untangle the folds of your history in postgraduate education? Can you recognize the residency in its precertification function and quit calling it a scholarly episode? If you consider it and evaluate it as specialty training primarily, then be as tough as you want to about it. Evaluate it as training for the specialty board examination and improve your assessment devices in that framework. Hold to the highest standards. This would be one way to disentangle yourselves from the shrouds of your history.

Can you identify, cherish, and reward the really small percentage of academically oriented medical postgraduate students? I think you can, and you can differentially reward them because you have already rewarded the good-conduct cases who are in for the specialty qualification experience only.

Within medical schools, all of which are of acceptable quality, can you differentially encourage, in the face of laws and medical economics, some of the schools that really do concentrate on turning out differential types of students? Or would this destroy the integrity of the whole enterprise? You are better able to answer this than I, but I believe that medical education already recognizes that about ten or so schools are the outstanding contributors to medical education and research. Do you want to make this differential explicit to students? You certainly know it yourselves.

Can you pound away at the attitudes students bring to the medical school? I know that you do this now in the very nature of your indoctrination, but can you do it better by some greater understanding of the formation of these attitudes and the ways they can be modified? My memory is that at the 1956 Institute this was a real topic of discussion.

Now, if none of these suggestions is practical—and one may very well say they are not—remember that you here in this audience are the least practical in the entire profession of medicine and the most able to afford the luxury of being impractical, because you in the medical schools are the prime shapers of the future of medicine.

CHAPTER 6

The Role of Examining Boards in Medical Education and in Qualification for Clinical Practice

BY JOHN P. HUBBARD

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The increasing use of National Board examinations in medical schools on the one hand, and the increasing acceptance of National Board certification by state boards on the other, lead to the hope that physicians may eventually be admitted to the practice of their profession at the conclusion of their formal years of education without further examination. This objective becomes feasible when the educational process has built into it an extramural, valid, and reliable examination system that can be accepted by state boards as an impartial and accurate qualification for licensure and practice.

Standards applied by medical schools in granting M.D. degrees and by state licensing boards in granting permission to practice are not uniform for all candidates. National Board examinations provide such uniformity. Their validity is attested by high correlations with cumulative appraisal of student performance by medical school faculties. The examinations are kept up to date through annual revision and reflect medical teaching throughout the country. They should not, however, be used as the sole criterion for determining promotion or graduation.

MEDICAL EDUCATION in the United States is confronted with the fact that, before a physician can practice the profession for which he has been prepared, he must meet the requirements of a state board of medical licensing. It is not enough that he has graduated from an approved medical school or has had added years of general or specialized training. No matter how well qualified he may be, he must satisfy the state board on two counts: First, he must meet the requirements specified by the laws of that particular state—requirements that are sometimes very specific as to the type of internship (whether rotating or straight), the medical curriculum, and in some states even the content of the premedical years. Second, having met these requirements, he must take the examination offered by the state board itself or present evidence that he has successfully passed the examinations of the National Board of Medical Examiners.

Most of the state laws that today govern licensing and medical practice were established in the latter half of the nineteenth century. Owing to the low educational standards and the many proprietary schools of that time, the laws not infrequently excluded from their examining boards any member of a medical

school faculty, thus bringing about a separation between education and the licensing function. Certain states still carry such restrictive legislation on their books; state laws change slowly. One state law today requires representation on its examining board from homeopathy and the eclectic school. Although medical education is hardly recognizable now in terms of that of 50 to 75 years ago, medical schools and teaching hospitals are bound and circumscribed by legal regulations born of the needs of an earlier day.

In the hope of ironing out some of the difficulties created by the variation in state laws, the National Board of Medical Examiners was created to provide a uniform and high standard of medical qualification that would be acceptable to state licensing boards without further examination. The history of the National Board has been marked by gradually increasing and hard-won understanding and cooperation on the part of the licensing authorities, so that now the certificate of the National Board is accepted as adequate qualification for the practice of medicine in 42 states, the District of Columbia, and the territories.

At the present time, therefore, we find a situation characterized by three interacting factors: (1) a system of state licensing that is deeply rooted in the principle of states' rights; (2) a standard of medical education such that all medical schools in the United States today are approved Grade A schools, unapproved schools having been gradually eliminated; and (3) a growing recognition of a generally accepted qualification for licensure. These three interrelated systems—state boards, medical schools, and the National Board—all have one primary objective: to assure that well-qualified physicians, and only well-qualified physicians, are admitted to the practice of medicine.

Now, having outlined this situation frankly and critically, I shall presume to offer some ideas for the further integration of these three systems.

The M.D. degree as sole qualification for licensure

Let us look first at the M.D. degree as a qualification for licensure. Should we in the United States do as is done in a number of other countries: adopt the principle that graduation from an approved medical school and the acquisition of an M.D. degree are sufficient for admitting a physician to the practice of medicine without further examination?

If state boards—and state boards are here to stay—are to assess qualifications in other than a rubber-stamp fashion, any general certification of qualification must have three characteristics: (1) it must be constant with respect to both place and time; (2) it must provide a valid differentiation between those who are considered qualified and those who are not considered qualified; and (3) the state board should have access to detailed information about the factors upon which the qualification rests.

The question then comes more sharply into focus: are these three characteristics inherent in graduation from a medical school and the acquisition of an M.D. degree? Even though all medical schools in the United States are now classified as Grade A, can the certification of graduation—the M.D. degree—be accepted as constant with respect to time and place? Does the M.D. degree have the same meaning in one school as another and from one year to the next?

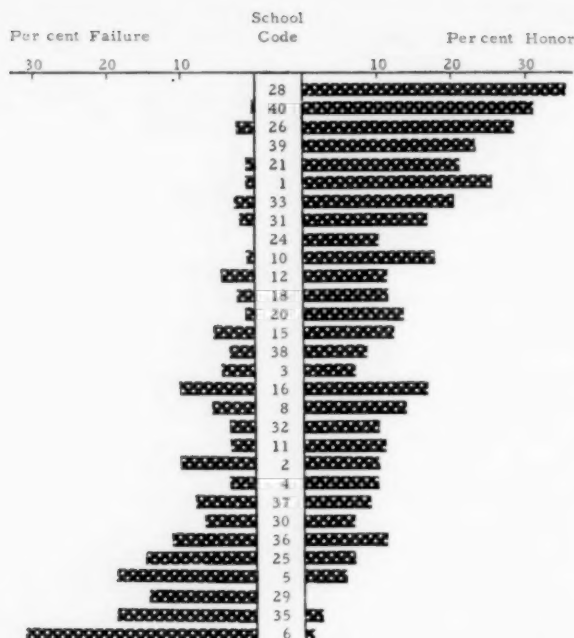


FIG. 1.—Summary of results of examination in surgery in 30 medical schools (Part II, April 1959). Note that school code numbers do not coincide with those used by the Association of American Medical Colleges.

Within a single school a grading or ranking system may be altogether consistent and valid, but it does not follow that a grade in one school is equivalent to a grade in another school. I believe we can agree without argument that a student who is considered to be doing undistinguished but passing work in one school might have failed in another school. The inequalities among medical schools are not infrequently matters of subjective opinion, but when medical school classes are compared on the basis of impartial extramural examinations, differences from school to school can be demonstrated with considerable precision.

Figure 1 shows very clearly the wide variations in student performance for 30 senior classes in which all, or virtually all, of the students of the class took Part II of the National Board examinations in surgery in April 1959. In the class with the best group performance 36 per cent of the students obtained honor grades and there were no failures. In marked contrast the class with the poorest group performance for this test had 1.5 per cent honor grades and 31 per cent failures. Similar results may be found in each of the other tests of Part I and Part II.

Since, therefore, an individual physician may be awarded his M.D. degree by a school at the top of the list or at the bottom of the list, the M.D. degree by itself cannot be relied upon as a consistent measurement of an individual's qualification for—or lack of qualification for—the practice of medicine.

Furthermore, medical school evaluations fail to meet the third requirement for

a generally acceptable qualification. They do not provide the state board easy access to information about the factors upon which they make their evaluations. To be sure, some state boards have endeavored to meet this problem by making personal tours of inspection to medical schools. This, however, is hardly a very satisfactory solution to the problem.

Therefore, the medical degree fails to meet adequately any of the three basic requirements. The discrimination between passing and failing differs widely; the steps leading to graduation are variable; and the state board has no objective way of evaluating the educational standards of the individual schools.

State board examinations

Let us now, then, turn to an appraisal of the state board examinations. During 1958, a total of 15,240 physicians were licensed to practice medicine in the United States and territories. Of this total number, about half (7,315) were licensed by passing the examinations of the individual state boards. The remaining half (7,925) were granted licenses by reciprocity with another state board or by endorsement of the certificate of the National Board of Medical Examiners.

Quite apart from the enormous duplication of time and effort expended by the 55 licensing boards in setting up separate sets of examinations for the 7,000 physicians, the more important consideration is the validity and comparability of the examination results. The same questions that were asked of the acceptability of the M.D. degree are also applicable to the results of the state board examinations.

Do the results of state board examinations have the same meaning in one state as another? The available facts tend to point in the opposite direction. For example, it is difficult to have confidence in the examinations of a state board that has a reputation for giving an easy examination with no failures. In 1958 nearly half the state boards reported no failures in the examinations of a total of 2,000 physicians. In the past five years, six state boards have reported no failures in their state examinations during this period, yet they have examined 3,345 physicians.

What interpretation is to be given to the results of the examinations of those states in which the record seems to favor the graduates of the medical schools within the state? During 1958 there were 18 state boards with no failures for the medical schools within their borders. On the other hand, although half the state boards failed no one, the other half failed 243 graduates of 66 approved medical schools in the United States, including schools generally recognized as having the highest standards.

State board examinations, therefore, also fail to meet adequately any of the three basic requirements of a comprehensive evaluation system. This brings us to the National Board and its relationship to medical education and to qualification for the practice of medicine.

National Board examinations and qualification for practice

With regard to the role of the National Board in evaluating qualification for licensure, the same questions may again be asked as have now been asked of the

TABLE 6.1
CORRELATIONS BETWEEN NATIONAL
BOARD PART II SCORES AND THE
FOUR-YEAR CUMULATIVE AVER-
AGES OF SCHOOL GRADES FROM
16 MEDICAL SCHOOLS

School	Coefficient of correlation	School	Coefficient of correlation
A	.86	I	.68
B	.80	J	.68
C	.79	K	.68
D	.78	L	.64
E	.76	M	.64
F	.74	N	.61
G	.72	O	.61
H	.70	P	.57

medical school degree and of the state board examinations: Are the examinations reliable and valid? Does an honor grade of 88 or a minimum passing grade of 75 mean the same in Maine and California, and in Washington and Florida? Is there demonstrable evidence that the examinations really do relate to the ability of the physician? Can a state obtain full and detailed information about the content of the examination and the manner of grading it? In the interests of time, I shall give only a few brief answers to these questions.

First, the objective multiple-choice examinations currently used by the National Board do have demonstrable validity and reliability, using these terms in their strict sense as applied to the science of educational measurement. Much could be said and an array of data could be presented in support of this statement; I shall mention only one rather convincing piece of evidence.

I believe you will agree that one of the best currently available means of evaluating a class of students is the faculty itself. Wide variations do appear in the ability of individual students to master different subjects, but at the end of the year, when departmental grades or ratings are averaged, considerable reliance can be placed upon the faculty's judgment in classifying the students, at least in broad categories such as top third, middle third, and low third. When the performance of each of the traditional four years is averaged at the end of the fourth year, an index is then obtained of the cumulative judgment of the faculty over the entire four-year period. This faculty evaluation, however, does not provide a basis for comparison between one school and another.

As we have already noted, a grade of A may and often does have very different meaning from school to school. If, however, it can be shown that the rank order of a student class based upon grades of National Board examinations correlates closely with the rank order based upon cumulative judgment of students by their own faculty, then it follows that we have an examination that not only appears to be measuring students much as their own faculty has measured them, but is also comparable from school to school.

The degree to which the Part II examination grades do in fact agree with the judgment of medical school faculties in ranking their own students has been determined in a cooperative study undertaken jointly by the National Board and the Division of Basic Research of the Association of American Medical Colleges. For a group of 16 medical schools, each of which used National Board examinations for their entire class and were also able to provide a ranking of their own

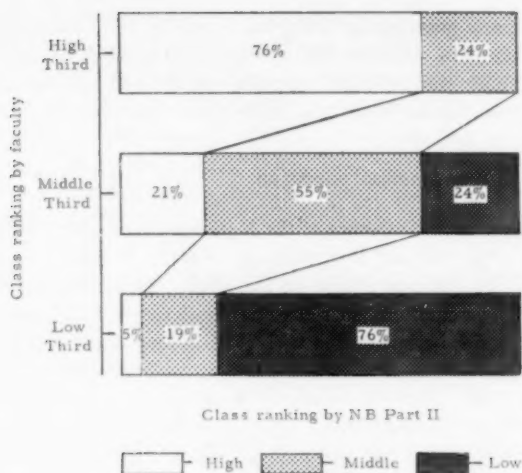


FIG. 2.—Correlation between class ranking by faculty and by Part II of National Boards ($r = .86$).

students, a coefficient of correlation between the grades obtained on Part II examinations of the National Board and the faculty ranking of their students was computed.

As shown in Table 6.1, a very high correlation does exist between the faculty rankings and the rankings by Part II of the National Board examinations. This correlation becomes even more apparent when studied in an individual school. In Figure 2 the horizontal bars represent the high third, middle third, and low third of the student class as judged by its own faculty. This is a cumulative four-year ranking of the class. The ranking by the National Board Part II is shown by the shading of the bars. Thus, it is seen that 76 per cent of the high third, as ranked by the faculty, were also high third as ranked by the National Board. And, similarly, 76 per cent of the low students, as ranked by the faculty, were ranked low by the National Board.

It is clear from these data that the results of the Part II examinations do in fact correspond extraordinarily closely with the four-year cumulative appraisal of the students by their own faculties. In my opinion, no more convincing demonstration could be made of the validity of the National Board examinations.

Obviously, grades on National Board examinations mean the same whether given in one section of the country or another, and they mean the same from one year to the next. Whereas school grades may have different meanings in different schools, a grade of 90 or a grade of 75 on National Board examinations has precisely the same meaning irrespective of the medical school attended. In addition, the manner in which each individual test is prepared by a separate committee of senior faculty members, with rotating membership and wide geographic distribution, assures that the examinations are kept up to date and reflect medical teaching throughout the country.

Furthermore, any member of a state board who wishes to be altogether familiar with the content of the examinations upon which the National Board certificate is based, may study sample examinations in detail or attend one of the many two-day meetings at which examinations for the ensuing year are prepared.

The National Board and medical education

Let us now turn to the influence of the National Board examinations on medical education. Is the National Board helping to promote ever better medical education or—and this question should be looked at realistically—is the system of National Board examinations so rigid and firmly established that it may discourage change and experimentation with curriculum content or scheduling?

In recent years, there has been a gradual but significant change in the function of the National Board. Having originated as an agency to provide generally accepted examinations that individuals might elect in lieu of state board examinations, the National Board has assumed additional responsibilities as a service agency providing comprehensive or departmental examinations for medical schools, state boards, and specialty boards; for postgraduate courses; and for the examination of foreign physicians.

There are now 34 medical schools that incorporate National Board examinations into their teaching programs. Each of these schools receives not only the individual grades for their students, but also a tabulated summary that permits detailed comparisons with national averages. When studied closely, these summaries of class performance may be used as a direct reflection of the effectiveness of the teaching program.

Admittedly, however, any examination, no matter how valid and reliable, provides only a limited and incomplete evaluation of a student or a class. The National Board subscribes wholly to a statement appearing in *The Rockefeller Report on Education*:¹ "Test scores are one kind of data to be placed alongside other kinds of data. The test score is not to be worshipped as a datum so decisive that it alone can be used to settle an individual's fate; it is a highly useful addition to other data but should not replace them."

Also, it is the repeatedly expressed conviction of the National Board that its function is to provide a measurement of what is being taught in medical schools rather than to become involved in the business of determining what should be taught. The National Board makes every effort to keep in step with the advances in medical education but does not presume to be out in front leading the procession.

Nevertheless, when an extramural examination is set up as a requirement to meet certain objectives, it becomes inevitable that the nature and content of this examination may have an effect upon the nature and content of the teaching program. This effect will be proportional to the importance attached to results of the examination by faculty on the one hand and by students on the other.

We are not unaware that some medical school faculties place a great deal of importance upon having their students pass National Board examinations. We

¹ Special Studies Project Report V, Rockefeller Brothers Fund, America at Mid-Century Series.

realize, also, that certain schools do in fact tend to shape their curriculum to this end. In earlier days, when the examinations were the essay type, a faculty could and actually did team up with the students in a guessing game, reviewing recently used sets of questions and predicting, sometimes with considerable success, the questions in the forthcoming examinations—and coaching their students accordingly. This rather dubious pedagogical exercise was seriously interrupted with the change to the objective multiple-choice examinations.

Now, in the Part I or Part II set of examinations, the student is confronted with approximately 1,000 questions. He can, if he wishes, get hold of mimeographed sets of questions that are circulated around in some fraternity houses, but then he finds, perhaps to his dismay, that the questions on the actual examinations are new and different. The only sensible way for a student to be well-prepared for this type of examination is, in the first place, to be well-taught and, in the second place, to undertake a general review of the subject using familiar textbooks and giving special attention to any areas in which he may feel weak.

In one school in particular during the past year, we have seen very direct evidence of the interest of the faculty in the results of the National Board examinations. I refer to the survey recently made by Dr. J. Murray Kinsman, Dean of the University of Louisville School of Medicine. Responses to a questionnaire he circulated indicate both the increasing use of the National Board examination results by medical school faculties and also the wide differences in the policies of these faculties. Certain schools do, in fact, require successful completion of National Board examinations. One school reported as follows: "Every subject must be passed in order to obtain a degree." This is placing too much importance on a single examination, no matter how good it is thought to be. Most schools follow the wiser principles contained in the Rockefeller report, and this same principle has frequently been expressed by the National Board in what might be called its credo: "The results of National Board examinations will, we hope, help a faculty in appraising its students. But they are not intended to relieve the faculty of its own responsibility in arriving at final decisions."

So far in this discussion we have been considering the written examinations of Parts I and II. A word might also be said about Part III. The purpose of the Part III examinations, given after one year of internship, is basically an attempt to determine whether the individual who has an M.D. degree, who has demonstrated his knowledge in passing Parts I and II, and who has had an internship at an approved hospital, can demonstrate ability to apply his knowledge to the clinical examination and management of a patient. In short, can he behave like a physician?

I shall not dwell upon the National Board's Part III except to say that we are dissatisfied with it. As it is conducted now, it certainly does not have the reliability or validity that can be shown for the tests of Part I and Part II. Furthermore, the difficulties of a decentralized examination on a national scale have assumed almost impossible proportions. There is, however, a strong feeling that a test of competence in a practical situation, or a series of practical situations, is essential to a generally accepted certification of qualification for the practice of medicine. Consequently, an earnest study has been started to see how this actually can be accomplished at the end of the internship year.

Conclusion

Finally, I believe we may be encouraged by the trends that can be detected in the relationship of the examining boards to medical education.

First, state boards are tending to become less rigid with regard to curriculum content of the educational system. Perhaps you are familiar with a publication of the Federation of State Boards, entitled *A Guide to the Essentials of a Modern Medical Practice Act*.² This outlines in general terms the educational qualifications of a physician, requiring only that the applicant should have graduated from an approved medical school and should have completed one year of internship. It is sensibly silent on the details of curriculum or the type of internship.

Second, the fact that the National Board examinations are actually prepared by hard-working committees of senior faculty with rotating membership gives assurance that they reflect not only the content but also the philosophy of the changing pattern of medical education.

Third, the National Board, being a voluntary agency, is not bound by the slow-moving process of law. It is flexible and can keep in step with the advances in medical education and can adjust to new ideas and new practices. Although the basic science examinations of Part I are customarily used for students at the end of the second year, they may be given earlier or later.

All of these factors taken together offer hope of a favorable integration of the three interacting systems I have been discussing—medical schools, state boards, and the National Board. With the increasing use of National Board examinations in medical schools on the one hand, and the increasing acceptance of National Board certification by state boards on the other, we may be approaching a highly desirable goal: the admission of physicians to the practice of their profession at the conclusion of their formal years of education without further examination. This objective becomes feasible when the educational process has built into it an extramural, valid, and reliable examination system that can be accepted by state boards as an impartial and accurate qualification for licensure and practice.

² Published by the Federation of State Medical Boards of the United States, 1956, Walter L. Biering, M.D., Secretary, 354 State Office Building, Des Moines 19, Iowa.

CHAPTER 7

Two Views of the Specialty Boards

A. A Surgeon's View

BY JOHN H. GIBBON, JR.

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In teaching, emphasis should be placed on self-education. The purpose of medical boards is not to educate or train the specialist, but to protect society by insuring the competence of the certified specialist. The requirements of the various boards should be reviewed and in many cases made less rigid. The board examinations, however, should be rigorous. Policing activities are not the proper function of boards. The role of the boards in establishing specialists' proficiency should not be assumed by universities.

BEFORE TALKING about the specialty boards, what they are, what they do, and how they began, I should like to discuss two phases of medical education: departmental structure and self-education. The latter problem relates to a later discussion of whether a proper activity of specialty boards is to determine the continued competence of people who have already passed the examinations. Finally, I shall discuss what Dr. John G. Darley so brilliantly presented in his paper, the relationship of universities to the specialty boards (see Chapter 5).

Undergraduate medical education

There has been a great deal of talk about changes in the curriculum in the first two years of medical school. Although I happen to believe that the changes in curriculum that have taken place over the last ten to twenty years are good, I think the heart of the problem has been avoided because of reluctance to discuss departmental structure. Dr. J. Englebert Dunphy (see Chapter 1, Section A) suggested giving the first two years back to the basic medical sciences, but I should like to raise the question of whether some departments, particularly in these preclinical sciences, should be abolished or should be incorporated with other departments. A department that is not producing new knowledge might well be one that no longer has a right to separate existence in a medical school. I look forward to the founding of some new medical school with an entirely fresh viewpoint about departmental structure and willingness to experiment along these lines.

In the teaching of anatomy, all but a few brilliant anatomists divorce structure from function and place too much emphasis on structural detail. Should we continue departments of anatomy as they now exist? They have difficulty in filling

faculty vacancies—I would suggest that this problem might be partially solved if anatomy occupied less time in the curriculum. There are other possibilities. One hundred years ago, anatomy was often taught by surgeons. Perhaps present-day departments of anatomy and surgery should be combined, or perhaps anatomy should be taught by those departments in which anatomical knowledge is essential to the treatment of patients. For example, orthopedic surgeons might teach osteology and the anatomy of the extremities since they deal with disease and injury to the skeletal system. Possibly we should combine anatomy and physiology into one department so that structure and function could come together.

Should we continue departments of pathology? Instruction in many of these departments, it seems to me, has altered little since the days of Virchow. Should we introduce new subjects in the first two years such as the behavioral sciences, a preclinical department that might serve as an introduction to psychiatry in the last two years?

In the clinical years, I believe there are too many departments in the specialties of medicine and surgery. Should such specialty department teaching be abolished completely in the clinical years, and should we perhaps emphasize more the patient as a whole, and consider that instruction in special fields belongs to graduate medical education? We have seen the gradual decrease in hours assigned to some special departments, such as otorhinolaryngology. Yet it is usually difficult to persuade departments to relinquish hours they no longer need. I believe that treatment of the patient as a whole man should be emphasized continuously in the clinical years.

The second consideration of change in undergraduate medical education that I would like to urge is a shift in emphasis from imparting a large body of knowledge to self-education, as Dr. Stead has recommended (see Chapter 4). There is a certain minimum amount of knowledge that has to be communicated to an undergraduate medical student, but should we not emphasize more and more the importance of helping the student learn how to educate himself for the rest of his life?

This facet of medical school education is pertinent to the question of whether the specialty boards should re-examine physicians whom they have certified periodically throughout their professional life. If we initiate the habit of self-education through critical reading beginning in the first year of medical school, then we need not be concerned with ascertaining whether physicians freeze after the four years of undergraduate medical education or whether they continue to educate themselves.

Purposes of the specialty boards

Let us move on to the examining boards in medical specialties. What are their purposes and what do they do? I should like to point out, first of all, that the boards are not directly concerned with graduate education in that they are not responsible for providing the education. I would like to advance the thesis that their primary purpose is to protect the public and, secondarily, to protect the real specialist.

Look back for a minute into one of the special fields—my own of surgery, for

example. Almost 600 years ago, in 1369, the Guild of Surgeons was founded in London. Two Masters, selected from this Guild, were sworn in before the Court of Aldermen of the City of London and given power to report the faults of unskilled surgeons. The history of the surgeons of London from then on for the next 500 years was intertwined with the Barber Companies until these companies finally ceased to exist. During these centuries, the Guild of Surgeons and the Barber Companies were given certain powers to protect the public. They had the power to inflict punishment by fines, imprisonment, or other means. I won't go further with that history except to point out that 600 years ago in England the Board of Aldermen of the City of London did not go to Oxford or Cambridge University but went directly to the people who were skilled in their profession and asked them to protect the public against incompetent practitioners. Thus over many centuries these Guilds had legal authority to protect the public from unskilled practitioners of their profession.

The specialty boards of today can exert influence only by publishing the names of those certified by the specialty boards in the *Directory of Medical Specialists*. What we are doing today is policing ourselves without any legal authority, in contrast to what took place in England 600 years ago.

Now to review, for the moment, the history of our boards.¹ You are all familiar with it and I will summarize it very briefly. The first board was the American Board of Ophthalmology, founded in 1916. The second, the American Board of Otolaryngology, was founded in 1924, and the third, the American Board of Obstetrics and Gynecology, was founded in 1930, followed by Dermatology in 1932.

Then in 1933 and 1934, the Advisory Board for Medical Specialties was founded with representatives from the Association of American Medical Colleges and from other interested associations and the specialty boards themselves. The original purpose of founding the Advisory Board was to establish procedures for the formation of other boards. Only the four mentioned above then existed.

The Advisory Board stated in its preamble that the purpose of the specialty boards was: "... to insure the public, both lay and medical and for its protection, that persons claiming to be specialists, presumably with special efficiency in one or another branches of medicine, actually possessed the qualifications they claimed." This is not an educational function. It does not belong to the universities. It belongs, really, to the public policing bodies, and in a way that is what the boards are. I should not have used the term "policing" because I am going to speak against it in a minute.

In the decade from 1930 to 1940, eleven more examining boards were formed, and then four more between 1947 and 1950. No new specialty boards have been established for the last nine years. The Advisory Board has voted that no more

¹ Incidentally, Dr. Julius Comroe in his talk at the Second World Congress on Medical Education said that the examining and certifying boards are self-appointed. Everyone knows that is not true. Furthermore, he asserted that "hospitals are not and never have been part of our total structure of medical education." That is a most extravagant statement. I admire Julius Comroe, but he must have gotten out of the wrong side of the bed the morning he wrote this speech. Hospitals bear the same relation to the clinical years of medical education as laboratories do to the first two years. To take away the hospitals where the medical student comes in contact with the patient would be turning back the clock of progress in medical education by a full century.

boards be formed, and that whenever possible, other special groups be provided for within the boards of medicine and surgery.

Of the 19 specialty boards, 13 refer to the fact that one of their main purposes is to protect the public, and they have accomplished a great deal toward this end. They have raised the standards of training in special fields in this country, and without a doubt lay boards of trustees in hospitals use these lists of specialists—quite properly it seems to me—to determine the qualifications of the staff. They have no other objective means of determining such qualifications. On the other hand, certification by a specialty board should never be considered as a necessary prerequisite to an appointment to a position on the faculty of a university.

Minor faults of the specialty boards

There are a few minor deficiencies of the boards which I think ought to be mentioned; I emphasize *minor*. These deficiencies are being and will continue to be corrected. Perhaps the representatives on the Advisory Board could hasten such corrections.

There are five points I would like to bring up. Let us talk first about membership on the boards. The board membership, it seems to me, should not remain static. No one, for example, should hold office for 17 years as occurred in the American Board of Dermatology. Of the 19 established boards, 11 publish in the *Directory of Specialists* the terms of rotation of the board members, and this is good. We should not have cliques determining the certification of people in their specialties.

The second point is that a number of the boards are so bold as to state that they want to supervise how a fellow behaves after he has received his certificate. I believe that this is impossible. Certainly the American Board of Surgery could not do it. But 6 of the 19 Boards—and this was in the last *Directory of Specialists*—6 of the 19 require that the members who hold their certificates must practice principally in the specialty in which they hold their certificate. The Board of Anesthesiology goes even further and states that it will revoke a man's certificate if he fails to confine his practice to anesthesiology. Such restrictions are not within the province of the boards, which should concern themselves solely with examinations.

Now, as to the question of policing—some boards still have a policing policy that is often quite ridiculous. Physical Medicine and Rehabilitation revokes the certificates of those who fail to keep their competence in the field. Yet how is this to be determined except by re-examination? There used to be boards that would not certify anyone if he held a certificate from another board. Can you imagine anything more ridiculous? Only one board listed in the last *Directory* still held this regulation. In brief, I feel that policing functions do not belong within the province of the boards and that revocation of certificates is foolish.

Fourth, I would like to discuss the present policy of the Advisory Board with regard to the breadth of the specialist's background. Let me again use surgery as my example. Only a few of the surgical specialty boards require training in general surgery prior to admission to their special field. The Board of Thoracic Surgery is the only one that requires certification by the American Board of Surgery

before taking the examination. The American Board of Proctology requires two years in general surgery as does the American Board of Plastic Surgery. On the other hand, the boards of Orthopaedic Surgery and Neurosurgery require only one year. Neurosurgery actually requires only one year of straight surgical internship. Perhaps Ophthalmology and Otolaryngology are justified in not requiring general surgical training. Obstetrics and Gynecology require no training in general surgery and say in their preamble that gynecology and obstetrics should be "inseparably interwoven." In my humble opinion, gynecology should be inseparably interwoven with training and experience in general and abdominal surgery.

Finally and most important among the faults, it seems to me, is the rigidity—and this is what I think some of the universities have been talking about—the rigidity of the requirements before a candidate is even admitted to examination. I should say 5 or 6 of the 19 boards have pages and pages of requirements, including directions as to how case reports should be typed on sheets of paper $8\frac{1}{2} \times 11$, just how they should be spaced, and just how wide the margins should be! This is a *reductio ad absurdum*.

The Association of American Medical Colleges could help by urging that these requirements be made less rigid and that allowance be made for experimentation in the training of the surgeon. At the same time, let the examinations remain rigorous. I believe Dr. John G. Darley (see Chapter 5) would agree with this. Dr. Dunphy has done a great deal, particularly in the American Board of Surgery, of which he is chief executive officer, to urge that we increase the skill of the examiner so that we can detect candidates who are not properly trained. Then we would be able to have less rigid training requirements prior to taking the examination.

Universities and the specialty boards

Now, finally, just a word about "advanced" degrees in surgery. It appears to me that we run down the degree of *doctor* of medicine if we urge people who are training in surgery to take a *master* of science in surgery. If you already have a doctor's degree in medicine, why should you want a master's—a lesser degree—in surgery? If the universities want to give degrees of M.S. and Ph.D. in surgery, all well and good, but holders of such degrees cannot necessarily be regarded as competent surgeons.

The boards concern themselves with training and competence in special fields of medicine. The boards exist primarily to protect the public. Surely this is not the function of a university! I suppose that much of the dissatisfaction of the universities with the boards lies in the rigidity of their requirements. Perhaps they object to the boards' stating that "this man has to spend such and such a length of time in such and such a field, and during that length of time he must do this and that and the other." As I have previously stated, the pre-examination requirements of many of the boards are undoubtedly too rigid and should be liberalized. But let's not go overboard and presume that the universities ought to take over the boards' function of protection of the public, which I think is wholly impossible for them to do.

A second point about the relationship of universities to the boards is that the

demand for specialists in this country is so great that it would be impossible for the universities, with the enormous financial expenditures involved, to take on the training of all surgeons in their postgraduate schools. I believe the figures are that 11,000 surgeons who are concerned with the training of residents in surgery have positions on the faculties of medical schools, and that something like 13,000 do not hold such positions.

B. A Radiologist's View

BY LEO G. RIGLER

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Radiology as a specialty is relatively young, and its departmental status in the medical school has been only recently established. The American Board of Radiology brought higher standards to the practice of radiology and improved and organized the training of specialists at a high level. Scholarship and research, however, have not improved under the influence of the Board. Such deficiencies have resulted primarily from overloading staffs with service demands. Inadequacies in graduate teaching have resulted from a lack of recognition by medical schools of the needs of radiology departments, rather than from the effects of requirements imposed by the American Board of Radiology. Radiology faculties and teaching fellows must be incorporated into the medical school.

MY EXPERIENCE represents some 30 years of teaching in a radiology department and some 14 years on the American Board of Radiology, so that I am speaking from points of view of both teacher and board member. I have left both of these enterprises behind for about two years now; I could wish the time had been even longer so that I might speak more retrospectively and perhaps more objectively.

The impact of the American Board of Radiology is somewhat different from that of most boards and therefore is not entirely analogous to board problems generally, but a review of the effects it has had may be helpful.

There are certain historical aspects in the development of radiology as a specialty and certain specific features of its scope that we need to understand if the Board's effects are to be properly assessed. Dr. John H. Gibbon, Jr. (see Section A) was able to go back to the fourteenth century, but when I discuss the history of radiology I can only talk about the twentieth century. Radiology was conceived by a physicist, was developed in its early stages in part by engineers and in part by photographers, and was applied to medicine by dermatologists and almost every other kind of physician. It was naturally in a chaotic state at the beginning of the century.

A year ago, I had occasion to study the career of Eugene Caldwell, who became the first professor of radiology at Columbia University and head of the department at Presbyterian Hospital in New York. His career epitomizes the stages of development of roentgen diagnosis. Caldwell was an electrical engineer who became interested in photography and in x rays; he left a lucrative position as a graduate engineer to purchase from a photographer some x-ray equipment which the photographer was using to do radiography for physicians. Caldwell proceeded to do the same for a time. He found it a most interesting enterprise, but he soon found also that he was being asked to name the structures that were exhibited by the various shadows seen in the roentgenograms. So he took a year off and studied anatomy. On his return to his practice, doing radiography for physicians, he soon found it necessary to determine what the effects of disease processes were on the organs seen in the films, so he took a year off to study pathology. Finally, some 15 years after he had graduated from engineering, he took the full medical course and became a medical radiologist; he was one of the early pioneers in this field. The evolution of the specialty, as it took place in the early part of the century, followed a similar pattern.

Up to 1930 there were not more than five full departments of radiology in the medical schools in this country; there are still a few schools without such a department. As a teaching method, radiology may be used in two ways. It can be a superb visual aid in teaching anatomy, physiology, and pathology, and it can serve as a correlating mechanism for the other specialists. In addition, radiology has developed a curriculum of its own to impart to the student the principles and practices of this phase of medicine.

Effects of the Board requirements

Radiology is unique among the clinical specialties in that it cuts across all phases of medicine. The radiologist is a sort of general practitioner among specialists. In one other respect, the radiologist is different from his colleagues: he is likely, more than any other specialist, to serve only as a consultant. He is on trial, then, before his colleagues, before medical boards, before hospital administrations, rather than before the patient or any lay group. The certificate from an examining board therefore means far more to him than it would were he in almost any other specialty. One can practice pediatrics without a Board certificate and be very successful. To a considerable degree, surgery and internal medicine are practiced in this way, but one cannot practice radiology without a certificate and have any opportunity for success.

For these reasons, the impact of the American Board of Radiology is probably more profound than that of any other specialty board. The resident in training, thinking of course of his future, is greatly influenced by the need for fulfilling the requirements and passing the examinations of the Board. His attention may be focused upon these aspects of his education to a disproportionate degree.

We could discuss the effects of the Board and its examinations in a number of contexts, as for example, the effect upon the training of the specialist himself, the effect upon the graduate training of other specialists, and the effect upon graduate education in radiology in the medical schools—that is, in regard to scholarship

and research. We might also consider the effect upon medical practice, for the impact of the Board on the practice of radiology has been considerable. I shall discuss only the first three.

Prior to World War I there was little organized training in radiology in this country, for it had not yet been accepted as a specialty. I believe Dr. George Holmes initiated the first residency at the Massachusetts General Hospital about 1917, but most of the training was irregular and of the pure preceptorship variety. At the end of World War I, however, many physicians entered into the practice of radiology. They were called the "six weeks wonders" since they were the graduates of an Army short course in roentgenology and became radiologists almost overnight.

The effect of the establishment of the American Board of Radiology in 1933 was really enormous. The institution of standards, the requirement of a specific term of training of three years, and shortly thereafter the institution of an inspection and approval system for residencies in various hospitals all had a very salutary effect. From a chaotic, irregular, haphazard program, the Board developed one with a degree of uniformity and with specific minimal basic education requirements, especially in physics and pathology. Within a surprisingly short period of time, the Board became all-powerful in the graduate education of the radiologist, and the immediate results were undoubtedly excellent.

Conscious of the extent of its influence, the Board tried to restrain itself from too much discipline, from insisting on too much uniformity. But I must say, in reference to what Dr. Gibbon has said about policing, that the pressure for regulation does not come from the Board itself. The pressure comes from medical societies who have shaken warning fingers at the Board and have said, "you ought to do this" and "you ought to do that" in regard to controlling the behavior of the practitioner. The Board has refrained, insofar as possible, from pressures for increasing conformity. It is true that the Board has attempted to determine the competency of the institutions giving training and has succeeded to some extent. Certainly some program was necessary, and I have no doubt the Board will continue some inspection system.

Almost simultaneously with the improvement that occurred as a result of the establishment of the Board, there came a vast expansion in the field of radiology. The increased clinical demand was so great that most of us were unable to equip or staff our departments adequately. Service needs became pressing as they expanded enormously through the thirties, and clinical duties predominated all our considerations. At the same time the numbers of residents and graduate students increased steadily. The necessity of fulfilling the Board requirements and the scarcity of teachers or preceptors for the increasing number of residents in radiology produced a marked change in the relationship between the nonradiological house officer and the x-ray department. Prior to this time, often with the help and cooperation of the radiologist, residents in medicine, surgery, and other specialties were given some training in techniques and diagnostic signs. For instance, those interested in gastroenterology were taught some fluoroscopy of the gastrointestinal tract; those interested in the chest received some rudimentary training in cardiopulmonary fluoroscopy and radiography.

The Board requirements inevitably effected the exclusion of nonradiological

residents from active participation in the work of the department. In large part this was due to the increase in the number of radiological residents who were spending three full years in the department; it was necessary to give them all the clinical opportunity, all the attention that was available, and therefore there was no time for residents in other fields. Another contributing factor, I suspect, was the feeling of the teacher of radiology that he must help solidify the position of this young specialty, that he must help to make it strong, independent, and secure from the presumed incursions of other specialties. Still another factor was the feeling that the small amount of training given to other groups might do more harm than good. There are inherent dangers in the use of radiation. Both the direct deleterious effects and the potentially tragic results of errors in interpretation and errors in treatment are of such an order that it seemed undesirable to train anyone partially in its use. Whatever the reasons, the Board and its program have sharply limited, if not nearly eliminated, the training of other specialists in radiology, at least within the radiology departments.

No one would contest the radiologist's responsibility to teach undergraduate students and other house officers. Certainly he should, and I think in most institutions he does a great deal of such teaching. But this instruction is in the area of general knowledge which all physicians need to have about radiology, its indications, its contra-indications, its dangers, its deleterious effects, its values, its limitations.

Finally, there is the effect of Board requirements and examinations on the university graduate teaching program. Here the tendency of all examining boards to stress the specialty as a technical discipline, a vocation if you please, had its effect in making graduate teaching programs into what some of our deans contemptuously call "trade schools." It is inevitable that such examinations should emphasize skills, specific knowledge, and practical clinical application. As Dr. Gibbon has said so well, the purpose and the duty of each specialty board is to determine whether a man is safe, whether he is competent enough to practice his specialty in such a way as to do more good than harm.

The standards of daily radiological practice have been raised to a remarkable degree, but in the process I fear scholarship and research have been impeded. The Board in its examinations cannot be concerned with such matters, for this is not their business. Scholarships and research are the business of the medical schools, of the graduate programs in the universities. But the demands of the examinations, their tremendous import for the candidate, tend to make him keep his eye on examinations, as if they were the eventual goal. As a result, it becomes more difficult to interest him in scholarly pursuits.

The relatively small part that scholarly enterprises play in the graduate training program in radiology is only in part the fault of the Board's requirements. In some part, it results from the rapid development of the teaching hospital as a service institution. In the average hospital or clinic which lacks the advantages of a medical school—the advantages of experimental laboratories and of a basic science faculty—it seems reasonable to give training on a somewhat vocational basis. The standards, the requirements, and the examinations of the Board are favorable influences in this situation and the training programs work out very well, I think, for the practicing radiologist. In the medical school, however, where

the opportunity to educate scholars, investigators, and teachers is at hand, there should be a very different type of program.

Graduate teaching programs in medical schools

There are many reasons why graduate teaching programs are not what they should be in many medical schools. One of the difficulties lies in the fact that almost all university hospitals have undertaken too large a service load for the size of the faculty. Clinical demands are so great and expansion has been so rapid that teaching hospitals have not tried especially hard to confine their graduate programs to potential scholars, or investigators, or teachers. They have accepted students at various aptitudes and ability levels; in fact, they have competed with the nonteaching hospitals for graduate students in general.

In attempting to help those residents who have no particular scholarly interest to complete Board requirements, the faculty too often lacks time to build a good research program or a good scholarly program. There are, of course, many striking exceptions—many very honorable exceptions in fact—but they are, I am afraid, the exception rather than the rule.

I do not believe that it is necessary to set up separate certifying agencies for medical schools, nor do I think that the requirements of the Board necessarily impede high-grade graduate teaching. I think it is necessary for the medical schools to establish scholarly programs completely independent of Board requirements, completely independent of Board examinations. We should make the graduate student a candidate for an advanced degree. If he does not like the idea of another degree, some other symbolic goal may be created. But we should give the graduate student opportunity and stimulus for scholarly achievement in one fashion or another. Make him do a thesis; make him do research. If he does not do these things, he does not belong in a medical school environment.

Perhaps the medical schools ought to take the lead in lengthening the period of training, for it may well be that a three-year program does not permit the residents to qualify themselves for the Board and at the same time pursue other interests. That being the case, the residency in the medical school should be increased to four years or five years, if necessary. Such a change has already been instituted at the University of California at Los Angeles where we have a four-year program. At Minnesota, we have had a three-and-one-half-year program for many years. The University of Pennsylvania, I understand, now has a four-year program in radiology.

If we could stop being concerned so much about the service demands of our teaching hospitals and concern ourselves rather with quality requirements, I think much could be accomplished. The graduate student who can qualify for a degree or other symbol of scholarly achievement should have no difficulty with Board examinations. The Board requirements should be no more than an irritating side issue, far less demanding than the qualifications of medical school status. In order to accomplish such an objective, however, medical schools must undertake several modifications. They must incorporate their radiological faculty into the medical school faculty rather than into the hospital staff. Too many radiological groups are simply service accessories to the hospital. The same procedure

would be necessary for the residents, or at least for those we might call teaching fellows within the radiology department; they should have their place in the medical school organization. Furthermore, medical school administrations must find sufficient funds to permit a large enough staff to care adequately for the large service requirements and to have enough time for teaching and investigation.

Radiology can take its proper place among the medical specialties as a scholarly discipline, with a teaching and research program of high status, provided such reforms are carried out. The requirements and examinations of the American Board of Radiology need not affect the graduate teaching in this field adversely if the medical schools will give full consideration to the needs of the radiology department.



PART III

Science and Art in Teaching Responsibility for Patients

	PAGE
Chapter 8. <i>Knowledge, Conviction, and Ignorance</i> by John D. Benjamin	117
Chapter 9. <i>The Physician-Patient Relationship</i> by Herbert S. Gaskill	133
Chapter 10. <i>Teaching the Science and Art of Patient Responsibility: A Panel</i> moderated by Albert J. Solnit	141
Chapter 11. <i>Physician Opinion on Education and the Physician-Patient Relationship</i> by Charles F. Schumacher and Helen Hofer Gee	155



CHAPTER 8

Knowledge, Conviction, and Ignorance

BY JOHN D. BENJAMIN¹

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Dynamic psychiatry and psychology—which engage in the study of human beings as biopsychological units interacting with each other in a wide variety of social groups—are immature as sciences and extremely complex. Scientific development is hampered by difficulties involved in achieving quantification of variables, in developing valid and reliable observational techniques, and in designing experiments that do not violate ethical restrictions on the manipulation of variables. One result is that conviction, which in other sciences is usually confined to value considerations, plays an important role in the evaluation of proposed theories and hypotheses. It is important to discriminate scientifically sound first-order convictions based on evidence, from scientifically unsound second-order convictions derived from needs, wishes, fears, and values.

Psychiatrists and psychologists are obliged as scientists to communicate the bases of their knowledge and the reasons for their convictions. Fulfillment of this obligation may not dissolve resistance, but at least it will increase the opportunity for meaningful scientific criticism and understanding. The scientific status of the major orientations of dynamic psychiatry: experiential, psychotherapeutic, and psychosomatic, vary both in terms of degree to which they are characterized by knowledge, conviction, and ignorance and the degree to which communication about them is subject to the distortions of second-order conviction. It is recommended that teachers of psychiatry distinguish what they know, what they think they know, and what they don't know, and that they communicate these distinctions in teaching medical students, giving evidence of knowledge and minimizing teaching by authority. Students should be given the opportunity to gain knowledge and develop convictions on their own, and areas of doubt, uncertainty, and conflicting opinion should be pointed out and discussed.

MY TOPIC has to do with some of the relationships of clinical psychiatry to science, or, less pretentiously put, to facts. We shall examine, nonsystematically and necessarily incompletely, to what degree psychiatry is scientifically founded and to what degree it is not, and consider the implications of these findings for teaching the subject to medical students.

As is well known, opinions on this matter vary widely, and sometimes vehemently. Thus Dr. Jacques Barzun refers in a recent publication (6)² to psychology and psychiatry as “two demi-sciences ridden by philanthropic moralism.” Now I feel certain that my talk will have little to do with philanthropy, but I suspect that toward its end a note of moralism may well creep in. I think it only

¹ This address is based in part on an unpublished address of the same title given at the Annual Meeting of The National Association for Mental Health, Indianapolis, 1954.

² Boldface numbers in parentheses refer to the bibliography at the end of this chapter.

decent to warn you of this, so that you may be on guard—and that is the first and only act of philanthropy I intend to perform today.

Considering the amount of time available, it is necessary that I delimit my topic in several respects. First of all, I do not intend to talk much about the philosophy of science, a field into which, as an amateur, I have made a number of excursions (8, 9, 12). Second, as a corollary: when I use the word science in this particular discussion, please read it, or hear it, with a small "s." I shall not be referring to the upper-case Science of the logical positivists, but to actual, living, everyday science as exemplified, in the past and at present, by scientists at work in different areas, attacking problems of different degrees of complexity, with different methods, with varying chances of obtaining approximate problem solutions, and of course with greatly varying abilities, motivations, and other personality characteristics codetermining their actual operations within the general framework of scientific methods and a scientific attitude.

Furthermore, in discussing the extent to which psychiatry is scientifically founded, I shall not be referring to the whole of this discipline, but rather to that part of it which is usually called *modern dynamic psychiatry*, as it is taught today, with variations, in most of our medical schools. It is this aspect of psychiatry which is the most frequent target for accusations of unscientific and even antiscientific attitudes. Few would deny that careful behavioral observation, description, and classification are scientific operations, even though by themselves they hardly constitute an advanced stage of any science. Except for stating, not for the first time (8, 9, 11), that they have been seriously neglected in our psychiatric culture, to the detriment rather than benefit of dynamic psychiatric understanding, I shall ignore this aspect of our field for the specific purposes of this discussion.

Although dynamic psychiatry is in large part derived from psychoanalysis, and developed by psychoanalytically trained psychiatrists, it is, I think, a mistake to equate it with psychoanalysis to the extent that this is often done. Without Freud and psychoanalysis, modern psychiatry as we know it would not exist. But it has other roots as well; roots in Meyerian psychobiology; roots in educational and social psychology, and in Dewian philosophy; roots, above all, in our American social, political, and cultural history and climate, as I have expounded in greater detail elsewhere (9). It is both larger than psychoanalysis, in the areas it covers, and smaller, in the sense that substantial parts of psychoanalytic personality theory are either essentially ignored, or at any rate in no way integrated into dynamic psychiatric theory and practice. The term psychoanalytically oriented psychiatry, therefore, while unquestionably a valid and meaningful one, can also in my opinion be misleading, particularly in terms of discussions of scientific validity. Among the most important concepts of psychoanalysis for dynamic psychiatry as it exists today—concepts that have become an integral part of its thinking, at best, and its verbalizations, at the least—are those of *unconscious motivation*, of *conflict*, of *defense*, of *transference*, and of *regression*.

This nonidentity of the two disciplines leads to the fourth, and final, delimitation of my topic. I shall not discuss in any broad and systematic sense the question of psychoanalysis as a science, a subject on which much has been written

in recent years (16, 19, 21, 23, 25, 26, 28, 38, 42), and one of great personal interest to me (8, 10, 12). Of necessity, however, it will be touched upon tangentially at those several points where it is directly pertinent to the aims of this presentation.

FIRST- AND SECOND-ORDER CONVICTIONS: GENERALIZATIONS

We are now in a position to come to grips more directly with our topic, as defined by our title: "Knowledge, Conviction, and Ignorance," or "What We Know, What We Think We Know, and What We Know We Don't Know and Wish We Did." In all natural sciences there are areas of more or less firmly established facts, areas of relative uncertainty and doubt, and areas of almost complete lack of knowledge. Viewed solely from this context, psychiatry and the human biological, psychological, and social sciences underlying it could be said to be characterized at present by relatively large areas of uncertainty and ignorance. This state of affairs seems natural enough when one considers the youthfulness of the disciplines involved, and contrasts this with the complexity of the systems under study—human beings as biopsychological units interacting with each other in social groups (11) ranging in the course of development from the primary mother-child unit through the family to larger societal structures.

It would be consoling if we could attribute all our differences from other sciences, as well as all our imperfections, to this one source—youthful immaturity. That it is an important factor is indisputable; and to avoid misunderstanding I had better state explicitly that I am here using the term immaturity to describe the present stage of development of our *sciences*, and not necessarily of either their practitioners or their critics. Kubie's interesting thoughts and comments on the question of the maturity of the *scientist* (29), as well as my own points of agreement and disagreement with him, fall outside the restricted scope of this discussion. But it is perhaps pertinent to state an opinion: that one important criterion of maturity in the scientist, *as a scientist*, is that he correctly judge the degree of maturity or immaturity of the field of science in which he is working, and act accordingly.

Beyond this factor of relative youthfulness, however, there are other perhaps even more important ones involved. I have already mentioned the complexity of the systems being investigated. To this I should have to add such problems as the nature of measures, the difficulties in achieving meaningful quantification, the ethical limitations on controlled experimental manipulation of some important variables, the relationships between the intrapsychic and the overt behavioral, and the unreliability involved in using ourselves as measuring instruments for other human beings. Mere mention of these well-known problems comes perilously close to banality in the absence of a more detailed analysis of them, and of past and current efforts, in many different directions, to avoid them or to solve them. Any such attempt at elucidation, however, would lead us directly into just that discussion of the philosophy of science as it relates to our field and to psychology in general that I am of necessity omitting from this presentation.

I intend, rather, to spend some time in examining one particular phenomenon that is especially characteristic of clinical psychiatry and psychoanalysis. Its name is contained in my title. For you will notice that I could have, but did not,

say "Knowledge, *Uncertainty*, and Ignorance," or "Knowledge, *Doubt*, and Ignorance," or even "Knowledge, *Opinion*, and Ignorance." What is this thing conviction, and what is it doing in science? And, specifically, why is there so much of it among us in the psychiatric field? To be sure, all scientists, like all other human beings, have convictions; but usually, or at least traditionally, these are about *values*, and not about the correctness or incorrectness of a specific theory or hypothesis. In religion, ethics, politics, art, and many other aspects of life we live by convictions. Their derivation, including their relationships to unconscious determinants as well as to culturally codetermined values, is in itself a legitimate subject of interest to the psychological scientist. But in science itself there does not seem offhand to be a place for convictions of the sort defined. For hunches, guesses, intuitions, speculations, yes; for convictions, no. In fact, a conviction about the value of scientific methods means, among other things, a *lack of firm conviction* about the correctness of an observation, interpretation, hypothesis, or theory until it has been tested by acceptable scientific criteria.

Clearly such a statement cannot be taken as absolute, since people seldom behave entirely in accordance with such abstract principles. For example, I have observed a number of highly creative and successful investigators in the physical and biological sciences who obviously became convinced of the validity of a theory in the act of propounding it, well in advance of any opportunity to test it. It was as though they had fallen in love with their theories and were temporarily blinded, as in *Liebesblindheit*, to defects in their love objects that were quite apparent to others. Nor is the analogy a superficial one, since rather pronounced self-love was to be found in many of these gifted men. This phenomenon in no way contradicts our thesis, however; rather, it confirms it. For in the social climate of science in which they worked, they not only pretended *not* to believe firmly in their theories without verification, but subjected them to experimental test in accordance with scientific mores, and were able to give up their belief in those cases where they were proved wrong. And the time lag was a relatively short one.

Do the large number of convictions shared by many of us in dynamic psychiatry mean, then, that as a group we are tender-minded, uncritical, and unscientific in our attitudes? My having phrased the question in this form may well lead you to expect from me a resounding "No." Unfortunately, the best I can do is one of those unsatisfactory "Well, yes and no, it all depends . . ." answers. For it seems to me that in a field such as ours, given its present stage of development and the nature of its data, that it is not the *having* of unverified convictions which is the criterion for an unscientific attitude; the contrary, I suspect, is often closer to the truth. It is, rather, the way the convictions were arrived at, and the eagerness, or lack of it, to have them subjected to meaningful rigorous testing whenever such testing is possible (12) that best distinguish a scientific from a nonscientific attitude. Convictions of both sorts are prevalent in our field—and for very good reasons.

Scientifically unsound, or second-order convictions (11) are based primarily on resonance with inner wishes, needs, and fears, and sometimes on social compliance with subcultural value systems. They can, of course, be right in spite of this, or sometimes even because of it, but they are equally or more likely to be

wrong, in which case their derivation is strikingly betrayed by the difficulty with which they are given up in the face of contrary evidence, as well as by a marked disinclination to gather such evidence or even to have it gathered by others. I am not referring here to that general and well-known tendency to ignore as long as possible evidence contrary to one's long established and deeply ingrained modes and habits of thinking in any field—a tendency that led the physicist Planck, for example, to state in effect in his later years that he had long since given up his earlier belief that scientists could really be convinced by evidence at all if it contradicted too much of what they were accustomed to consider axiomatic (37). I mean, rather, that beyond this there is a special susceptibility to second-order convictions about human psychology and psychopathology, since all statements in this area are statements about us, to which we can respond with pleasure or pride or lowered anxiety on the one hand, or with anger, fear, disgust, and other unpleasant feelings on the other. Leaving aside all theoretical and technical depth-psychological qualifications and elaborations of this question, it still remains so obvious as to be banal that *if* it is possible to avoid such feelings by disbelief, which often means firm belief in something else, it is a natural and up to a point adaptive device to utilize. And where there is no clear evidence one way or the other, as in our many areas of substantial ignorance, it is made somewhat easier for reasonably rational men, otherwise consciously dedicated to open-mindedness and the search for approximations to truth through scientific methods, to join their nonscientific fellows in this respect. If I may trust my own observations and judgments, the prevalence of second-order convictions about certain psychiatric problems is even higher among those outside the field, including many physical and biological scientists, than it is among psychiatrists themselves, although the convictions, as I shall exemplify later, may often be in opposite directions.

A scientifically sound, or first-order conviction (11), on the other hand, is based on evidence, but on evidence that has not yet been systematically assembled, ordered, or communicated in such a way as to make possible testable theory, or replicable experiments, or sometimes even observational consensus. Typically, such convictions arise from the clinic, from work with patients. Typically also, and well illustrated in the history of the medical sciences in general, there is a greater time lag between the accumulation of evidence and its systematic ordering and analysis in clinical than in nonclinical settings. This is in part because of the demands of service, in part because of lack of training in how to collect and analyze data systematically, and in part because of lack of incentive, but in part also because of the nature of the data themselves. It is regrettably true that this time lag is often greater than it need be. But it is also inevitable that the clinician (and to a significant though lesser extent the creative experimentalist also) sometimes gains convictions that he is unable, for the time being, fully to justify by objective scientific proof—inevitable, and, I think, on the whole good. For although such first-order convictions based on private and semiprivate interpretations of evidence gained from experience may well be wrong, by virtue of the limitations of the human intellect in dealing with data without the help of painfully learned methods of avoiding erroneous conclusions, they have often proved to be significantly right, in whole or in part.

The term first-order conviction is an inadequate shorthand expression for what is in reality a continuum ranging from something very close to scientific knowledge to something more akin to unrecognized hypothesis formulation. For example, knowledge of the *existence* of many phenomena seen as direct observables under the special conditions of a psychoanalytic or psychotherapeutic treatment situation can lead to convictions about the validity of *interpretations* of these phenomena in instances where they are not directly observable in the same sense. Convictions as to their universality, near universality, or lack of universality are again of another order, based on different sorts of nonsystematically organized evidence, and therefore requiring different operations for their validation. Convictions about the interrelationships of variables to each other are of still a different order. The hypothetical nature of many propositions concerning such interrelationships, no matter how high and how justified our levels of conviction about them may be, distinguishes them in principle from the primary data of factual observations as such, although in both cases problems of reliability as well as of validity arise. In general, a high level of conviction about such dynamic and genetic propositions is a function of their explanatory power (45) even more than of the observed association of variables.

We are by no means alone in science in this respect. I do not think it an overstatement to say that our belief in the broad outlines of evolutionary theory is essentially a very high-order conviction, based on its enormous explanatory power, which includes a lack of plausible *alternative* explanations of the observed facts, rather than on the possibility of controlled experimentation or of prediction, as this term is ordinarily understood. Scriven (43) has recently used this fact for a thoughtful discussion of the relative roles of explanation and prediction in different areas of science. While not subscribing to all his points of view, particularly about the nature of prediction (12), I find this article a refreshing contrast to that rigidity about the nature of science sometimes seen in *post facto* analyses of the processes of scientific discovery and scientific validation.

My analogy with evolutionary theory in terms of explanatory power serves also a second, and opposite, purpose—to point up major differences between the fields. The *measures* of comparative botany and zoology are for the most part objective, clear-cut, and easily describable. More generally, the evidence on which a firm conviction as to the over-all validity of evolutionary concepts can be gained is available to anyone who wishes to examine it. The same state of affairs does not hold true, at least not nearly to the same extent, for psychoanalysis and dynamic psychiatry. The reasons for this are obvious, but this in no way prevents it from being a major problem in scientific communication. Even on a purely intellectual level a solution to this problem is far from easy. The task of defining the situations in which the primary factual data are elicited and related to other data is a difficult and time-consuming one. An understandable reluctance to attempt such a task is then reinforced by emotional factors, to which we are just as prone as anyone else—factors determined in part by our own responses to what we perceive as resistance-motivated criticism by others (8). Now resistance, as discovered and defined by Freud, is a very real thing indeed, so real and so prevalent that it exists to some degree in all of us. It can, incidentally, be expressed by overcompliance and theoretical oversimplification within the ranks of our psy-

chiatric subculture as well as by the better recognized forms of hostility from without. But to invoke the concept of resistance in answering scientific criticism and doubt is just as absurd, logically, as it would be to omit it from the structure of our theory and the organization of our therapeutic and educational efforts (8). If we believe our facts to be just as much facts as in any other science, and our theories, built on them, to have the usual admixture of valid, partially valid but useful, and perhaps wholly invalid components, it clearly remains our obligation as scientists to try to communicate as best we can the bases of our knowledge and the reasons for our convictions. It is not that I entertain the fantasy that through publication of evidence resistances will somehow magically disappear, but rather that the opportunity for meaningful scientific criticism as well as understanding will be increased.

Happily, I think a clear-cut trend in this direction has developed over the past few years, although its progress is slow. There is still too much time spent in arguments about how good or bad a science psychoanalysis is as compared to the time spent in efforts to make it a better one. I say happily because our responsibility for scientific communication is not only a matter of abstract scientific ethics but also a response to a highly pragmatic scientific need. The impressive and exciting progress in basic cellular biology, biochemical and cytological genetics, neurophysiology, ethology, and information theory that has occurred in recent years holds great promise not only for medicine in general, but specifically also for psychology and psychiatry. Many of us, and I count myself definitely among these, feel that the major discoveries of Freud, for all the imperfections of psychoanalysis as a science, are of such a basic and fundamental nature as to make it impossible fully to realize the potential applicability of these other disciplines to problems of normal and pathological human behavior while ignoring the facts of psychoanalysis. Many, of course, would not subscribe to this statement; and as long as so much psychoanalytic knowledge remains essentially "private," they have every right and considerable reason for their skepticism, quite apart from resistances. But for those who *do* agree with it the moral as regards scientific responsibility seems obvious.

Before leaving this topic, a somewhat tangential but related comment is in order. Bringing the insights of psychoanalysis to bear upon the fields of science (27), education (31), and philosophy (26) can be of great interest in itself and of great value to these disciplines. But the scientific and therefore also the educational and philosophic problems of psychoanalysis, and with it dynamic psychiatry, are in no way thereby solved. In other words, psychoanalyzing science does not make psychoanalysis itself either more or less scientific than it was before.

FIRST- AND SECOND-ORDER CONVICTIONS: ILLUSTRATIONS

It is time to leave these generalizations for some concrete examples of what I have been talking about. Since I cannot possibly discuss here the evidence supporting my categorizations of convictions, what follows must of necessity be taken as one man's opinion, based on his appraisal of existing evidence, with a few references to the literature, but subject of course to the errors inherent in subjective judgments where definitive investigations are still lacking. I propose to limit my

illustrations to a few selected for their direct pertinence to the major orientations of dynamic psychiatry as such, thus omitting the bulk of the data, propositions, and assumptions of psychoanalysis proper.

Dynamic psychiatry, as it has developed predominantly in this country over the past few decades (3, 24, 32, 33, 47), is best characterized by three major trends, or orientations: an *experiential* orientation, a *psychotherapeutic* orientation, and a *psychosomatic* orientation, using this last term in its broadest and least specific sense (27, 39). By these I mean: (1) the recognition, or assumption, that actual life experiences, and most particularly those of infancy, childhood, and adolescence, are of major importance in codetermining the varieties of normal and pathological personality development; (2) the conviction that the pathogenic effects of at least some experiences can be partially or largely reversed by other experiences, including psychotherapy in its various forms; and (3) the conviction not only that emotions and conflicts contribute significantly, and in some cases perhaps specifically, to the pathogenesis of many physical illnesses, but also that physical illnesses, whatever their etiology, may involve patients in psychological problems requiring for their handling some knowledge of and training in human behavior and its motivations.

I shall merely mention, but not discuss, a fourth orientation that is having an increasingly productive impact on our field. I refer to a *developmental* orientation, based on the findings of developmental psychology and development biology as well as on those of psychoanalysis.

The experiential orientation of dynamic psychiatry

An experiential orientation toward questions of personality development is by no means confined to dynamic psychiatry. It permeates much of present-day learning theory, social and educational psychology, sociology, and anthropology. Nor is it a product of this or the last century only. On the contrary, scrutiny of the history of psychiatry clearly reveals alternating waves of greater and lesser emphasis upon life experiences as contrasted to constitutional or somatic factors as determinants of mental disease (1, 48). What is new in the modern scene is the postulation, and in part the demonstration, of the role of *specific sorts* of experiences, and particularly, though by no means exclusively, the experiences of infancy and early childhood, in helping shape personality in its varieties of normal and pathological developments.

I have recently had several occasions to examine some of the factors leading to that especially strong emphasis on the role of experience that is characteristic of our own culture (9, 11, 12, 13). In these discussions I stressed how necessary, valuable, and productive this point of view has proved to be, but also noted its obvious limitations in explanatory and predictive power when it assumes the form of an extreme environmentalism that essentially neglects innate variability as a codeterminant of behavioral variability. In reporting on some current developmental investigations, I attempted to demonstrate the empiric necessity for conceptualizing the old nature-nurture problem, in so far as it relates to *complex* behaviors, in terms of various sorts of interactions between innate and experiential universals and variables (12, 13).

How do we stand today regarding communicable knowledge in this aspect of

our discipline? There are many convincing experiments which have demonstrated the importance of experience in determining behaviors (e.g., 7, 15, 41), in humans and in other species. There are also many first-order convictions; some in the process of more or less rigorous validation, others further removed from this as an immediate possibility. And there are also areas of real ignorance, with their inevitable accompaniment of second-order convictions. As might be expected, the latter are particularly strong with respect to the etiology of the major psychoses, not only because of our human need for causal explanations, and because of the great medical and social importance of these conditions, but especially because of their strong emotional impact on us.

Instead of discussing the present evidence, or rather the lack of it, for either a predominantly experiential or a predominantly hereditary causation of the schizophrenias, let me illustrate the prevalence of second-order convictions in this area by relating an anecdote. A few years ago at Colorado we had the pleasure of a visit from Dr. Linus Pauling. In the course of a typically fascinating lecture on molecular diseases, in which, among other things, he reviewed the story of sickle-cell anemia and of the later work of his laboratory on pathological hemoglobins, he came to an exposition of his conviction, shared by many others, that mental disease in general would also eventually prove to be genetically determined. I noted that some of the audience, which up to this point had as a whole been as delighted with the clarity and creativity of the speaker's thoughts as with the wit and oratorical effectiveness of his presentation, now became even more animated; and I heard some whispered comments of approval and agreement. On the way out, I thought it would be of interest to elicit comments from some of my friends in the basic sciences and in the nonpsychiatric clinical departments. At first this was hardly necessary, for I found myself overwhelmed by such friendly but triumphant comments as "Well, what do you think of that?" "I'm sure he's right," "Wasn't that wonderful?" and from one colleague, "What price psychodynamics now?" Thinking that those who chose spontaneously to speak to me about it might represent a negatively biased sample, I made a few further inquiries the next morning, and ended up with a total sample of fifteen, thirteen basic scientists and two colleagues from clinical departments, excluding faculty wives. Eleven of the thirteen and two of the two were wholly supporting of Pauling's views, one expressed reservations, and one—a geneticist—was highly critical.

At this point my "investigation" almost faltered on a serious obstacle. For when I now approached the control, or second experimental, group and attempted to get opinions from my colleagues in psychiatry, I found that only one of them had gone to the lecture! However, it turned out that eight had either heard Dr. Pauling on this subject at the meeting of the American Psychiatric Association the previous spring, or had read the published version of his talk there. Of these, four objected on the general grounds of disbelief in genetic factors in schizophrenia. The other four were critical of Pauling's lack of appreciation of the experiential except in terms of vague and nonspecific stresses, but did not exclude the possibility of important hereditary elements in the genesis of schizophrenia from their thinking.

Following the time-honored tradition of covering up deficiencies in measures

and in samples by deficiencies in statistical analysis, I can report that the critical ratio of the differences of the percentages of second-order convictions in the two groups is 1.89, with a p of about .03. The probability that the consistent difference in the *direction* of these convictions is due to chance alone, however, is, by the least biased estimate, of the order of one in ten thousand!

The psychotherapeutic orientation of dynamic psychiatry

Discussion of the scientific status of the second major trend in dynamic psychiatry brings us into an area where systematic research is particularly difficult, and where, therefore, there is perhaps the greatest gap between first-order convictions based on experience and the communicable results of rigorous investigations.

By definition, the psychotherapeutic orientation is based on the conviction that the effects of at least some pathogenic experiences can be partially or substantially reversed or modified through psychological means. In many psychiatric training centers today there exists an additional conviction, which I share: that thorough *training* in therapy substantially increases the probabilities of its being helpful in an essentially unknown proportion of cases of different sorts. As a result, many psychiatrists devote hundreds of hours attempting to teach psychotherapeutic skills and principles to psychiatric residents. And of course the same holds true for later more advanced training in psychoanalytic therapy. We can leave out of consideration the fact that one of the major reasons for psychotherapeutic and psychoanalytic training is that it offers unique opportunities for learning things about people that are not easily accessible under other circumstances. We can also, for our present purposes, disregard the fact that there is some disagreement about the amount of time and emphasis that is best given to psychotherapy in the residency training program, as compared to many other aspects of psychiatry. For independently of these considerations it remains true that most of us, and again I specifically include myself, think we know that therapy can sometimes help patients, and that training helps develop better therapists.

With this as a background, I should like to quote from a recent and important publication containing the proceedings of a conference on research in psychotherapy held under the auspices of the American Psychological Association (40). In the course of a discussion of one of the presentations, Dr. David Shakow raised the question of the scientific and, by implication, the ethical problems involved in having essentially untrained therapists treating sick patients as part of a research project (which was not aimed at evaluating the effects of training or the lack of it). In commenting on this, Dr. J. McV. Hunt stressed his perception of the need for objective studies of just this point by the statement: "... I defy anybody here to indicate existing evidence . . . that the inexpert psychotherapist is any worse for the patient than the expert psychotherapist. At least, I know of no published data showing that the inexpert gets less improvement from his patients than the expert." I cite this statement, *not* to give you my first impatient reaction to it, but because it illustrates so well some of our problems in communication, and our obligations to communicate better.

Most of us recognize the power of experimental science, and the fact that where meaningful experimentation and meaningful quantification are possible, they ad-

vance the cause of scientific knowledge more surely and more effectively than any other methods—except the intuitive discoveries of genius. The recent history of biology, with its tremendous acceleration in the rate both of discovery and of clarification of hitherto uncertain issues, provides eloquent testimony to this effect. This statement is far from equivalent, however, to an acknowledgment that experimentation is the only basis for scientific knowledge; or, for that matter, that any sort of quantification is better than none.

The methodological and conceptual problems involved in meaningful systematic *outcome* research in psychotherapy are staggering in their complexity and difficulty. Some investigations of this sort have been ably designed, within limits, and they tend to support the thesis that psychotherapy does in fact make for change. Others are more equivocal, or even negative, in their results. Where there are gross indicators of relative success or failure, as for instance in illnesses often severe enough to require psychiatric hospitalization, the results to date are not encouraging as regards the ability of psychotherapies to prevent psychosis. But even here the surface has barely been scratched with respect to designing and implementing such studies. Where we are dealing with the more usual subjects for psychotherapy and psychoanalysis—such as symptom neurotics, neurotic character disorders, inhibited states, neurotic depressions, and the like—the problem of *measures*, not only of change as such, but of different kinds and degrees of change, is of an order of complexity that excludes meaningful experimentation until some preliminary problems have been solved. The task, as I see it, is to define and measure objective behavioral indices of intrapsychic change of the sort we are accustomed to call substantial improvement (or, to use a fancier and not too well understood term, structural change), and then to relate these to the varied processes of therapy. It is no accident that most of the experienced clinicians who are actively engaged in psychotherapeutic research are for the present studying process rather than outcome, although serious work in the latter field is also under way.

We have no particular reason, on a clinical level, to make any extravagant claims for the frequency with which psychoanalysis or intensive psychoanalytically oriented therapy is successful in this far-reaching sense, and I agree entirely with K. A. Menninger when he stresses that the educational value of psychoanalytic therapy surpasses, in general, its purely therapeutic value (34). Nor have we any more reason to depreciate less ambitious therapeutic goals, such as symptomatic improvement and temporary relief of suffering, than does medicine as a whole. But we have every reason to believe that in some instances we do achieve major changes, and that these are due to therapy and not to chance. It is our obligation, then, to communicate the data and the reasoning by which we arrive at such a conclusion. That this will be a tedious task is obvious; but even more onerous will be the job of reading and assimilating such material, once published. I would predict, in fact, that only a small proportion of those critics who, with full justification, have asked for such data will actually read it when it appears! But some will; and that is the important thing from the standpoint of communication.

I cannot do more here than mention another nonexperimental method for testing our knowledge and convictions: the method of individual prediction. I have discussed and in part exemplified the potentials and limitations of this method in a recent publication (12, cf. also 20).

Once the efficacy of our therapeutic technique is clearly demonstrated, the question raised by Hunt would become essentially as trivial as it would be to ask for an experimental demonstration that the untrained surgeon or internist does less well by his patients than the expert in these fields. Until that time, we shall continue to act on the basis of our convictions, as must any physician responsible for the welfare of patients, and train in those directions which seem to us, on the basis of experience, to promote that welfare best.

The psychosomatic orientation of dynamic psychiatry

Our third major orientation, that of so-called psychosomatic medicine in its least specific sense, is perhaps the one of greatest immediate pertinence to the education of the medical student and of the nonpsychiatric teacher and practitioner.

Some years ago a well-known physician expressed the opinion that psychiatry, along with internal medicine and surgery, was one of the three basic disciplines of medicine. We have all heard dozens of statements very much like this in the course of the last few decades, not only from psychiatrists, but from deans, internists, pediatricians, obstetricians and gynecologists, surgeons, and even occasionally from neurologists! Curricula have been reorganized in this direction, and a significant number of nonpsychiatric faculty members in various schools really subscribe to the thesis, as evidenced by the way they act. Others, of course, give lip service to it, and little else. And there remain a few hardy individuals who make no effort to conceal their opinion that there's not a word of truth to the whole business, at least as far as the basic concepts of dynamic psychiatry are concerned.

Why, then, do I choose such a banal comment for quotation? Because these words, when uttered, were not as unoriginal as they now sound. The man who delivered himself of them was Johann Christian Reil, professor of medicine at Halle and Berlin (1, 48). The time was more than 150 years ago, in 1803. Reil himself, who incidentally coined the term psychiatry, was a distinguished internist, one of the true pioneers in clinical descriptive psychiatry, a firm believer in what he termed psychotherapy, and a major early contributor to neuroanatomy. His name is known to all of us through the structure called "the island of Reil."

It is sobering to consider where we are after one-and-a-half centuries. For although a great deal has been accomplished in recent years, we have a long way to go before we reach that point, if ever we do, where Reil's dictum that psychiatry is one of the basic disciplines of medicine finds real acceptance among students, faculties, and the medical profession at large. It is not my purpose in this presentation to examine all the obstacles to such acceptance, and particularly not those which have their roots in the nature of human attitudes toward mental disease, and the resistances, fears, and hostilities aroused by it. I am restricting myself here to the consideration of the responsibilities of psychiatry, and psychiatrists, in partially overcoming these obstacles; and I am concerned even more specifically with the conviction that better scientific communication of what we know, as well as better scientific investigation in order to know more, are first among these responsibilities.

It is my impression that on the whole psychosomatic medicine has made somewhat better progress along these lines than has the rest of dynamic psychiatry. For various reasons, including the question of measures, it has been possible to carry through a number of meaningful experimental as well as clinical investigations, both in the field of the so-called psychosomatic diseases proper, if such exist (e.g., 17, 24, 35, 36, 46), and in the closely related field of psychophysiology (e.g., 30, 44).

The controversial question of psychosomatic specificity as such remains an open one. The efforts of Alexander and his associates to devise and utilize rigorous methods of testing their hypotheses have been pursued over a number of years with an admirable determination to plug all possible loopholes in their design (2, 4). But in my opinion, as well as that of many colleagues (4, 5, 9, 27), there still remain enough of these loopholes that the results to date neither prove nor disprove their theses. On a clinical level, many of us feel that some sort of partial specificity may well exist, whether this be of a causal or purely associative nature (4, 9, 17). Independently of the validity of their particular hypotheses, the work of this group has contributed much, and promises to contribute further, to our understanding of some psychosomatic relationships.

The nonspecific contributions of emotions and conflicts to the genesis and course of many somatic diseases is harder to deal with experimentally, and perhaps of somewhat less theoretical interest, but it is surely of equal if not greater importance in the practice of medicine. A number of significant approaches to systematic investigation have been attempted in this area also (2, 14, 17, 24).

And finally we have the task of helping the student understand and learn how to deal with the psychological problems that so often arise from physical illness, independently of its etiology. For this purpose, adequate conceptualization based on our knowledge, and further refinement of our knowledge, are equally necessary. It is possible to demonstrate a good deal in this field on a purely clinical level. There are a few systematic studies also that can help bring conviction to our students and colleagues alike about such things as the roles of regression, transference, dependency, hostility, love, and fear in shaping the doctor-patient and other therapeutic relationships about which Dr. Gaskill spoke earlier (see Chapter 9), and through which the whole course of an illness is sometimes significantly affected (14, 18, 39, 47).

THE RESPONSIBILITY OF TEACHING

I have outlined some of the major trends characterizing dynamic psychiatry today, and have attempted an informal examination of their present scientific status along a continuum ranging from ignorance at one end to well-established facts and principles at the other. We have found the middle area of first-order convictions based on personal experience to be a particularly large one in our field, and have examined some of the reasons why this is the case. We have also seen that areas of ignorance about human psychology provide a particularly fertile ground for the growth of what we have termed second-order convictions, and understand that this phenomenon arises from the subject matter of our discipline and its special impacts on us.

What are the implications of all this for teaching psychiatry to medical students? On purely rational grounds the answers seem obvious enough:

1. We should distinguish as best we can between what we really know, what we think we know, and what we do not know, or at best surmise.
2. We should try to give at least some of the evidence for our knowledge and for our convictions; we should try, that is, to minimize teaching by authority.
3. In consonance with the above, we should give the student as much opportunity as possible to gain knowledge and convictions for himself. This precept sets definite limits to the amount and sorts of data and theory that can meaningfully be taught to the student without special training. Among the concepts of psychoanalysis proper, those mentioned previously as basic to dynamic psychiatry—unconscious motivation, conflict, defense, transference, and regression—can all be demonstrated in convincing fashion, at least in their gross outlines.
4. We should point out and discuss with the students areas of doubt, uncertainty, and conflicting opinion in the field of psychiatry.

At first glance what I have just said will strike every dynamic psychiatrist, and many other educators as well, as having something empty, unrealistic, and unpsychological about it. It sounds as though I were talking about students as they should be, rather than students as they are, as though I were entirely neglecting much that we know about the role of authority in teaching, about the processes of identification involved in learning, about the teacher-student relationship as a living process with almost as much dynamic oomph to it as the parent-child and doctor-patient relationships. Taken literally, this impression of unreality is quite true. It is not hard to imagine how ineffective a teacher would be if he felt it necessary, in a compulsive fashion, to qualify every one of his statements with a discussion of the pros and cons of the question, if he could never permit himself a free expression of a conviction as a conviction. The student would be the first to rebel.

In a recent contribution, Lewin has discussed the role of infantile feelings of omniscience, first in oneself and then in one's parents, in shaping the student's expectations from his teachers and the teachers' responses to these (31). I cannot here give this subject the attention and clarification it deserves, but its implications for education in general, and particularly for teaching in a field like ours, are clearly pertinent to what I have just said.

Nevertheless, I think that in the long run our best hope for effectively teaching those aspects of psychiatry that are essential for sound medical practice lies in the direction I have outlined. The sort of learning that occurs through acceptance of authority can only be maintained and usefully applied if it is reinforced by experience and by insight. The same holds true for teaching our colleagues in clinical medicine. And it is by this time a truism that their help is indispensable to effective undergraduate psychiatric teaching.

The title of our topic at this Institute contains the phrase: "Teaching Responsibility." I should like to give this concluding section of my talk the title: "The Responsibility of Teaching." And this, I believe, is best fulfilled by the methods advocated—imparting our knowledge, sharing our convictions, and admitting our ignorance.

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CHAPTER 9

The Physician-Patient Relationship

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Transference, or the direction of stereotyped patterns of behavior unconsciously retained from childhood toward a new object (in this case the physician), is an important consideration in any physician-patient relationship. Countertransference, or similarly inappropriate responses in the behavior of the physician or other symbolic parent-figure, may also occur. Both phenomena may contribute significantly to the course of any type of illness, although they are more likely to occur under certain specific circumstances. Knowledge of these psychological factors in the physician-patient relationship and opportunity to develop skill in coping with them is the prerogative of every practitioner; teaching these skills should be part of the stock-in-trade of all teachers of clinical medicine. Integration of the knowledge of psychiatry with the knowledge of the other specialized disciplines is increasingly important if the aim of therapy is to be the care of the patient, and not just treatment of a disease.

THE PRACTICE of medicine throughout recorded history has rested substantially on the intuitive skills of physicians in meeting the emotional needs of the sick. A patient formerly sought the help of a physician because of his personal qualities, which had relatively little to do with realistic considerations—namely the skill of the physician in curing illness. The last hundred years have seen medicine advance with ever-increasing rapidity to take its rightful place as a science, however, and recent important advances have led to the era of causality-based therapeutics. Consequently, the patient seeking treatment for his illness today uses medical knowledge and skill as one criterion in choosing a physician.

At the turn of the century, just prior to the period of the most rapid acceleration in medical discoveries, William Osler in his essay "*Aequanimitas*"¹ paid tribute to the human elements in the relationship of the doctor to his patient. He carefully noted the frequent irrational responses of patients to the therapeutic efforts of the physician. His insight did not extend into the determinants of such behavior. However, Osler gave the young physician sage advice—to retain his equanimity and poise in the face of such irrational responses on the part of the patient, the implication being that the doctor should maintain his own perspective and objectivity without becoming personally involved, irrespective of the patient's behavior.²

¹ Osler, W. *Aequanimitas* (Philadelphia: P. Blakiston's Son and Company. 1905).

² The "Bed-Side Library for Medical Students" with which Osler concluded his volume of essays (*supra*) indicated his interest in the humanities as part of the "liberal education" which prepared the medical student for a career in medicine. No doubt this admonition was an important influence which contributed in no small way to the devotion of the "family" doctor to our "modern" concept of comprehensive medicine a generation ago.

BASIC PSYCHIATRIC CONSIDERATIONS

Almost simultaneously with the publication of this essay, modern dynamic concepts in psychiatry were introduced which have revolutionized our understanding of human behavior. Among the insights which were to become keystones of modern psychiatric thinking were the concepts of the unconscious, psychosexual development, the structural concepts of the mind, and—most important for our current discussion—the concept that patterns of early life experiences and attitudes tend to be repeated, often unrealistically. This phenomenon is often described under the term transference. During the early years of childhood the drives that furnish the individual's motivation undergo a series of maturational steps that contribute significantly to the organization of certain patterns of behavior. As the child grows, he has to learn to control his drives in conformity with the standards of the family and the culture in which he is raised. This learning codetermines the development of the Ego which is responsible for the control and direction of the drives. This interaction between maturation and experience is responsible for the gradually developing patterns of behavior of the individual.

The Ego, ideally, learns to master the drives in ways that provide realistic gratifications appropriate to the current life situation of the individual. Unfortunately not all learning leads to such adaptive behavior. Not infrequently the child, as a result of faulty learning, does not master these infantile impulses and remains fixated to certain levels of behavior that are inappropriate in the mature adult. As a consequence of such fixations, the individual unconsciously seeks continually to gratify or in various ways to defend against these infantile needs that should have been worked through during childhood. These immature desires or the defenses against these wishes are then "transferred" from the parents to other individuals who symbolically come to represent the parents.³

The inevitable traumata of childhood leave their imprint on each individual. Consequently everyone has some points of fixation that interfere with realistic object relationships due to the persistence of what Freud described under the term transference.⁴ The scope of inappropriate transference manifestations depends on the degree of maturity achieved by the individual. It will be negligible in those of relative maturity but will play an increasingly important role in the

³ Freud, S. "The Dynamics of the Transference," *Collected Papers II* (London: The Hogarth Press, 1948), pp. 312-32.

Freud, A. *The Ego and the Mechanism of Defense* (New York: International Universities Press, 1944).

⁴ Freud used the term transference to indicate the transfer of particular patterns of relationship with infantile objects to later objects. His primary emphasis was on the analyst's development of transference to the analyst in the course of psychoanalytic therapy. It is generally agreed that transference may occur in any object relationship. In a recent paper discussing transference ("Transference and Transference Neurosis," *Int. J. Psychoanal.* 37, 1956, p. 377), W. Hoffer wrote: "The term transference, stressing an aspect of the influence our childhood has on our life as a whole, thus refers to those observations in which people in their contacts with objects which may be real or imaginary, positive or negative or ambivalent, 'transfer' their memories of significant previous experiences and thus 'change the reality' of their objects, invest them with qualities from the past." Transference is being used in this more general sense in this discussion of the physician-patient relationship and not with its more specific meaning in connection with psychoanalytic therapy and the development of the transference neurosis.

interpersonal relationships of those individuals who are more infantile in their personality development. Furthermore, during periods of stress, both acute and chronic, any individual may regress temporarily to a more immature level of personality organization with the reactivation of infantile drive needs. Such regressions may be temporary or permanent depending on life situations and the way these behavioral manifestations are handled.

We all tend to interpret the present in terms of the past to varying degrees. The way we react to authority, the way we love, and our reaction to independence may or may not be appropriate to the real situation. The degree to which we transfer stereotyped patterns of behavior from the past to the present will influence significantly the handling of any reality situation or relationship with another individual.

These inappropriate responses, which may occur in any relationship, are particularly liable to develop under three circumstances: (1) the greater the symbolic implication of the relationship, as with a teacher, a minister, an employer, or a physician; (2) the longer the relationship continues; and (3) the greater the amount of regression that enters into the relationship. When regressive transference develops, the individual unconsciously tends to attribute to the other person many of the positive and negative feelings and attitudes he originally had to parents, siblings, and other important figures in his childhood, and thus to seek for more childlike gratification of unsatisfied wishes from the other individual. Such manifestations are particularly common in some patients with severe physical illnesses.⁵

We as physicians also have our own hostages to the past which, without our conscious awareness, enter into our management of patients and determine how we relate to them. Such evidences of inappropriate responses when they occur in the behavior of the physician are termed countertransference.⁶ Consequently it becomes important for us to evaluate critically our relationship to patients for the significant contributions we ourselves make to the relationship.

In many therapeutic relationships elements of transference develop. As physicians we have a realistic role—our knowledge and skill as doctors—as well as a social role as individuals of authority who minister to sick people; the latter role tends to attract the infantile attitudes that are transferred by patients. Illness frequently involves a temporary regression to dependence, and the situation of seeking help from another individual can strongly reinforce such regressive tendencies. The subsequent course of the patient's illness will in part be determined by the manner in which we respond to the request for relief from suffering. The attitudes of the patient toward the physician will be largely dependent on: (1) the type of illness and its chronicity, (2) the reality aspects of the personalities of the patient and the physician, and (3) the unrealistic reactions the patient has toward the doctor as determined by what we have termed transference.

⁵Numberg, H. *Psychological Interrelations Between Physicians and Patient* (Practice and Theory of Psychoanalysis; Nervous and Mental Disease Monographs), 1948, pp. 174-84.

Kaufman, M. R. "The Patient-Physician Relationship," *Teaching Psycho-therapeutic Medicine* (Harvard University Press, 1947), pp. 63-78.

⁶Spitz, R. A. "Countertransference," *J. Amer. Psychoanal. Assn.* 4, 1956, pp. 256-65.

Tower, L. E. "Countertransference," *J. Amer. Psychoanal. Assn.* 4, 1956, pp. 224-55.

SPECIFIC PROBLEMS OF TRANSFERENCE

With this introduction I shall now discuss a few specific problems of transference that we as physicians repeatedly face, i.e., transference situations involving unconscious fantasies about dependency, hostility, and sexuality.

Dependency

Regression is a normal response to illness and often a helpful one, but it activates increased demands for dependent gratification. The way the individual reacts to this inner need for increased passive gratification is dependent on his or her past history as well as on the physician's responses. Some patients react with vigorous protest and denial of the need; they have difficulty in seeking help, and if they do, only follow our directions with great reluctance. Others respond more normally; they trust us and carry out our orders reasonably and their dependency vanishes quickly with the return of health.

Still other patients seem to rush into illness and appear to relish the passive and dependent gratification attained through illness. Such individuals in their childhood have never learned to handle these dependency needs adequately, usually because of either insufficient gratification or overindulgence. Consequently they transfer their dependent needs to the physician and continue to demand the gratification of these infantile needs in an inappropriate manner. When the secondary gains from illness are real, as when war is in progress and recovery means a return to combat or at home when getting well means facing responsibilities that seem overwhelming, such patients present a real problem in management.

The physician faced with dependency reactions may respond in a variety of ways. He may become irritated, believe that his medical skill is being challenged, and be angry and hostile to the patient. Again he may find gratification in meeting the dependency needs of the patient, particularly if he has unresolved problems in this area. He may identify unconsciously with the patient and, through continuing the patient's dependence, indirectly gratify his own unresolved need. The mobilization of such inappropriate responses in the physician may interfere with his insight into the nature of the patient's difficulty and prevent a satisfactory resolution of the dependence. Recognition of both transference and countertransference problems will assist in their solution.

The three following cases are presented to illustrate contrasting reactions of patients to acute illness.

The first two patients found it very difficult to accept any dependency gratification, although temporary regression and dependence on others for their care is clearly indicated in the treatment of their illness. The mobilization of dependent needs results in the development of a transference of exaggerated independence and self-sufficiency. The third patient has an unconscious need to avoid an unpleasant reality for which the dependent situation seemed to offer a solution. The normal regression due to illness persisted after the physical illness had run its course, with the resulting picture of an infantile dependent relationship to the physician.

Mr. R. S. is a 23-year-old married senior in law school, who was admitted to the hospital with a history of cough, fever, and stabbing pain on inspiration in the right side of his chest of 18 hours' duration. Physical examination and roentgen findings are consistent with lobar pneumonia of the right lower lobe; he is started on appropriate antibiotic therapy. Throughout his hospital stay he is described by both nurses and doctors as an alert, active, intelligent man who is very anxious to discuss his illness in medical terms and who does not act as if he were sick. On the first day of admission, despite a temperature of 39°C, he gets out of bed and is frequently found visiting in other patients' rooms at the time when the nurse comes to give him his medication. He insists, when questioned, that he feels fine and does not need to stay in bed. He sleeps badly the night of admission, but does not complain or ask for any medication. He is frequently heard making the statement that he really does not think he requires either hospitalization or medical care.

Mr. A. H. is a 52-year-old married business executive, who was admitted to the hospital with severe left chest pain radiating down the left arm of sudden onset while watching a prize fight on television. On admission his blood pressure is 100/60 mm Hg; he is pale, dyspneic, and in shock. Electrocardiogram reveals evidence of myocardial infarction; he is placed on complete bedrest. Twenty-four hours later, the patient insists on having a telephone in his room so that he can conduct his business "as usual." He is jovial but faintly hostile with both doctors and nurses and repeatedly complains that people are treating him "like a baby" when he actually feels fine. His physician attempts to explain the significance of his illness; the patient appears to understand but continues to be extremely unhappy on his regime of bedrest and often complains that everyone is making "too great a fuss over nothing." He remains anxious and tense; sedation appears to increase rather than to decrease his excitement.

Mrs. R. S. is a 32-year-old married mother of four children, who was admitted to the hospital for signs and symptoms of acute appendicitis. Four hours after admission an appendectomy is done, and the patient's postoperative course is uneventful except that she continues to complain of not feeling well, of vague abdominal pain and gaseous distention. She frequently states she is afraid the operation was a mistake and she will not get well. No abnormal physical findings are demonstrable. The patient is very reluctant to get out of bed and makes frequent complaints that the medication she is getting is not correct, that she cannot eat the food because it is not what she is used to, and that she is particularly convinced the nursing care she is receiving is inadequate. By the fifth postoperative day she still remains in bed most of the time. She talks to nurses and doctors, as well as visitors, as if she were chronically ill and gives little evidence of any wish to leave the hospital. Further investigation at this point reveals that she is unhappily married to a man who has been repeatedly unfaithful to her, and she has many feelings of inadequacy about raising her children.

Being independent and resourceful is deeply ingrained in our culture, but when it goes to the extent of wishing to avoid any dependent gratifications, as in the first two patients, it has reached pathological proportions. Such exaggerated denial of dependency in its most extreme form is seen in many individuals who refuse to seek medical advice when they know they are ill. They may delay seeking treatment until they endanger their lives, e.g., patients with early signs and symptoms of malignant disease who refuse to go to their physician for a diagnostic evaluation.

The third patient unconsciously saw in illness a possible escape from a life situation that was far from satisfactory; regression to more infantile dependence is one method to avoid facing difficulties. Motivation plays an important part in any patient's recovery from illness, as was so clearly demonstrated during

World War II when getting well meant returning to combat or an unpleasant duty assignment. The undue persistence of symptoms or the development of new ones, accompanied by no evidence of organic disease, presented the medical officer with one of his most difficult diagnostic problems. Unfortunately, situations that appear equally unbearable to the individual confront many people in their daily lives. For those who have never learned to face issues realistically or who have had considerable deprivation of their dependency needs in childhood, chronic invalidism seems unconsciously to offer a solution, however unrealistic it may be.

Hostility

Everyone wants to be liked and appreciated. This often assumes greater importance to the physician, since being liked can be imputed to relate to his skill as a practitioner. Generally he is confronted only with the positive aspect of the patients' attitudes toward him. This may be because he cannot permit them to express any reservations about his care or because he misses the implications in their remarks and attitudes. The physician likes to be told that he is a good diagnostician, that he is considerate of patient needs, and how superior his care is. Many patients mean their praise, but occasionally they are less impressed with their physician. Praise at times may be a shield covering dissatisfaction. Certain individuals have great difficulty in expressing criticism directly, and thus they redouble their compliments to hide their irritation and anger. Whether the anger is justified or represents transferred attitudes may be of less importance than an adequate evaluation of the implicit attitudes and feelings of patients. If the resentments are allowed to continue smoldering, patients may feel forced to start or continue their "medical shopping." Recognition by the physician of his patients' negative attitudes, together with provision for sufficient opportunity to air these feelings (particularly if this is done before the "charge" has built up to too great an intensity), usually leads to a more satisfactory therapeutic relationship and may help patients deal with their aggressions more successfully in the future.

The following case illustrates the development of such a transference of hostile feelings, with its inevitable result—another dissatisfied patient who failed to obtain the treatment he sought and who then continued his medical shopping.

Mr. R. H. is a 42-year-old highly successful salesman, who has been troubled with recurrent headaches for nearly ten years. Periodically, when the headaches become unbearable, he seeks medical advice. The headaches have been completely studied, including neurological examination, electroencephalography, skull films, and on one occasion even pneumoencephalography. No organic pathology has ever been demonstrated. He has gone to a different physician each time he decided to seek medical help for his headaches. He starts out with each new one by stating how optimistic he is that this particular consultant is going to be able to diagnose and treat his headaches. For the first month or so this optimism continues. He glowingly reports a remarkable decrease in the frequency of his headaches and is very complimentary to the physician. However, with the passing of time, he becomes increasingly passive, more diffident and ingratiating. At the same time, he talks with considerable scorn about the inefficiency of his previous doctors and complains occasionally about the difficulties he has in his relationship with his boss.

The patient understandably becomes resentful toward his physician when no diagnosis is made that could lead to etiologically-based therapy. Realistically, Mr. R. H. had reason to be angry and one would expect him to express this to his successive physicians. The degree of this patient's anger was excessive and was reinforced by earlier experiences with his father, which had created a great deal of hostility and resentment that he had repressed and never resolved. This stored up, unconscious hostility augmented current situations of resentment and irritation to unrealistic proportions. In his difficulties with his current boss, and similar problems with previous employers, there was no overt expression of his resentment or anger. The hostility was replaced by submissiveness and exaggerated politeness until he found a trivial excuse for leaving the job. The immediate anger merely touched off the fuse of his deeply repressed resentments. These past resentments reinforced the current and realistic anger, making it impossible for him to be appropriately aggressive, a situation that inevitably results in failure to solve the problem.

Sexuality

Children develop early many thoughts and fantasies about physicians because of the special role they play in the life of the average individual. The physician is granted many privileges denied to most. He transgresses many taboos, e.g., looking at and examining forbidden parts of the body, inflicting pain, talking about subjects and functions that are usually hushed up but highly charged emotionally. Consequently children play at being doctor, partly to master actively what they have had to endure passively and partly to act out certain forbidden fantasies. Little wonder that the grown woman who as a little girl was unsuccessful in resolving her overly strong attachment to her father finds her role as a patient embarrassing. She unconsciously transfers those repressed sexual fantasies to the physician. Such a woman has to change physicians not infrequently; each pregnancy finds her with many rationalizations as to why she needs another obstetrician or why she postpones her periodic gynecologic examinations. When unconscious attitudes on the part of the physician lead him to participate in this "flirtation," the situation may become unmanageable; his lack of awareness of countertransference may necessitate a change of physicians for the patient. If the doctor recognizes the transference implications in a woman's behavior when she becomes flustered in the consultation room and forgets her appointments, he is in a position to manage the physician-patient relationship more effectively.

Any practitioner in the course of treating a female patient may find himself confronted by a transference involving unconscious sexual fantasies which may interfere with the therapeutic process. This case describes such a situation:

Mrs. K. N., a 32-year-old married mother of two children, goes to her obstetrician in the third month of her pregnancy for prenatal care. Her previous two pregnancies have been uneventful with uncomplicated deliveries. She has had a different obstetrician for each delivery and laughingly explains this by saying that she became "too friendly" with her previous doctors. She is a model patient for the next three months, keeping her appointments regularly, and no problems develop. However, her physician becomes aware that she is increasingly curious about his personal life and at the same time seems considerably more embarrassed in her subsequent visits to his

office. She tends, on occasion, to blush and to appear quite disconcerted. During the last two months of the pregnancy, she repeatedly forgets her appointments. The nurse calls to remind her of them, and it seems apparent she wants to keep contact with the physician as minimal as possible. When questioned as to anxiety about the delivery or her ability to care for the child, she says she has no particular fears. She has previously mentioned that this is a wanted, planned-for child and that she and her husband are looking forward to the new baby. Her delivery is uneventful. During the immediate *postpartum* period, despite previously seeming to be a model patient, she complains bitterly and frequently of pain from the episiotomy stitches and develops a transitory glove anesthesia of the right hand. Throughout this period she is anxious to leave the hospital and is very evasive with her physician.

The previous history of her obstetrical care should have alerted the physician to the possibility that ensued. Had the obstetrician been aware of the implications, he could have dealt with the patient's behavioral manifestations of the transference when they appeared. This could be done simply by a factual discussion of the realistic role of the physician and the possible confusion that may arise as a result of the mobilization of unconscious fantasies and feelings of which the patient is unaware. This need not necessarily involve prolonged psychiatric treatment that would seek to deal in a definitive way with these unconscious factors. Unfortunately, when the physician permits such transference manifestations to develop without attempt at interpretative intervention, the patient, because of her inappropriate feelings, finds it necessary to seek a new physician or fails to get the needed medical assistance she is seeking.

Transference may assume various roles in the doctor-patient relationship. These shadows of the past may obscure the realistic role of the physician and seriously jeopardize his therapeutic activity. He may unwittingly encourage the transference to develop due to ignorance or because of countertransference problems. He may with proper training recognize the meanings and implications of these manifestations and then deal with them within the limits of his insight and training.

CONCLUSION

This discussion of transference and countertransference has been highly condensed and to a degree overly simplified. Although it is evident that transference and countertransference are of major importance to psychiatry, it is equally apparent that their implications for many other therapeutic relationships are likewise significant. The teaching of this clinical skill I like to call *applied* psychiatry, as distinct from *clinical* psychiatry. Clearly, this knowledge is the prerogative of every physician, and its teaching should be the stock in trade of all of us who teach clinical medicine. The student as he learns his various roles in medicine identifies with his instructor's methods of solving problems. The young physician is unlikely to apply this knowledge in the care of other patients if the internist, the surgeon, the pediatrician, or the gynecologist who teach him consistently ignore such factors in physician-patient relationships. Specialization in medicine has advanced our medical knowledge greatly, but integration of the varied contributions of the several disciplines is increasingly important in both teaching and practice if the care of the individual and not his disease is the aim of therapy.

Some Clinical Views of the Physician-Patient Relationship

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DR. SOLNIT: *The purpose of this panel is to discuss various aspects of relationships between physicians and patients as they affect diagnosis and treatment. These relationships can be described as communication processes or as feeling states that physician and patient create in their cooperative efforts to solve the patient's health problems. This interaction can facilitate or interfere with the patient's adaptation and promote or block the effective work of the physician. The psychological effect of the physician's work is probably the most potent mechanism for the relief of pain that we have possessed over the centuries. Often it has been misused and abused. Until recent decades it has been considered an art as distinguished from science.*

The situation has changed with the advent of psychoanalysis and modern psychiatry. The translation of psychological concepts and insights into the clinical practice of medicine is one of the goals of medical education today. Our panel at this Institute consists of specialists in preventive medicine, pediatrics, gynecology, internal medicine, and surgery, who will discuss from their viewpoints the intentional manipulation of psychological factors involved in the physician-patient relationship. These factors have now become a part of our clinical scientific knowledge that can be analyzed and taught explicitly to all medical students.

Our first panelist is Dr. William S. Jordan, Jr., who will discuss the broadest implications of the physician-patient relationship.

DR. JORDAN: Earlier this month a report of special studies and questionnaire analyses was distributed to Institute participants. The analyses showed that one-half of the 1950 graduates learned of the physician-patient relationship through observation, that one-half felt the opportunities for learning of the relationship

in medical school were only fair or poor, and that one-third felt that practical instruction in the physician-patient relationship represented the most deficient area in their medical school curriculum. (These data are discussed in Chapter 11.)

The same week two national magazines carried articles, one entitled "The Changing Role of the Family Doctor" and the other "Rx: For Modern Medicine, Some Sympathy Added to Science." It is my thesis that the educational deficit defined by the data and the current examination of physicians by the lay press may well be interrelated.

I would like to begin our consideration of this possibility with an equation: the physician's perception of health needs plus his knowledge of resources, including self, equals the adequacy of health care provided. Adequacy of medical care is related to an awareness of the changing needs of the patient. Awareness, in turn, is related to the physician's knowledge and understanding of the patient's problems, not only in relation to disease, but also in relation to the patient as a person and as a member of society. During student progress through medical school and postgraduate training, increasing skill in diagnosis and therapy should be accompanied by a growing sense of complete and continuing responsibility for the care of the patient and his family, and by a knowledge of the role the community expects the physician to play.

A number of new words and new terms have been introduced to describe this concept—"comprehensive care," "continuing care," "clinical preventive medicine." Yet, as pointed out by Dr. Ward Darley in his address at the 1958 Annual Meeting of the Association of Teachers of Preventive Medicine:¹ "The concept of continuing, comprehensive care of individuals and families from birth to death, whether sick or well, is not getting very far very fast." Dr. Darley went on to give a number of reasons for the failure of this concept, three of which I wish to quote.

First: "Modern medical practice: The present patterns of medical care present barriers to the concept of continuing, comprehensive care because of the fragmentation of patient care that has resulted from specialization, practice habits that limit interest to the episodic care of illness, and efficiency measures that limit the amount of time a physician gives to the individual patient."

Second: "Medical education: The departmental organization of our clinical teaching departments in the medical schools has bolstered this pattern of fragmentation, episodic care, and efficiency. The clinical experience of students is almost exclusively confined to the short-term care of ill people within the framework of a specialty. Students see nothing or very little of the natural history of disease or of health."

Third: "Knowledge: While laboratory and bedside research have given us much knowledge that can be applied to the evaluation and management of health and the prevention of disease, we have very little knowledge that will permit the *deliberate* use of the doctor-patient relationship and the art of medicine in the interests of problem evaluation and management."

¹ Darley, Ward. "What Is the Next Step in Improving the Teaching of Preventive Medicine?" *Association of Teachers of Preventive Medicine News Letter*, 6, March, 1959.

If the university, because of its concern for the physician-patient relationship, considers awareness, understanding, and a sense of responsibility to be important attributes of its physician graduates, then medical schools and hospitals should design programs to develop constructive doctor-patient relationships, just as they design courses to teach biochemistry or physical diagnosis. In so doing, the medical schools should attempt to provide learning experiences that mold attitudes as well as impart knowledge.

The best way for the student to learn about the doctor-patient relationship is not observation but participation—participation in a responsible role as a physician charged with the care of patients. The third- or fourth-year student cannot be charged with the same degree of responsibility as the resident, an obvious fact whether responsibility relates to total patient care or definitive surgery. Nevertheless, the challenge to initiative and resourcefulness in handling real patient problems should be incorporated at all levels of training. When we synthesize situations that are not quite real, the student senses it and the motivation for learning and good performance decreases.

For purposes of illustration, let us consider the problem of chronic disease. In 1900, 46 per cent of the deaths in the United States were due to chronic disease; by 1955 the proportion had risen to 81 per cent. Mortality, however, is not the major concern. The question as to whether or when a person dies with a chronic condition has taken second place to a consideration of the degree of his disability as he lives with the disease, which includes attention to such measures as care and rehabilitation that are involved in the adjustment of the patient to society.

Most students are best able to comprehend the role of the physician as it relates to serving sick people, and they tend to measure the value of the physician's services in terms of the acuteness and severity of the patient's illness. Many physicians and most students lose interest in the long-term patient unless there is some acute exacerbation or urgent diagnostic problem. They tend to become frustrated in dealing with these patients when they feel they can do little or nothing for them medically. Yet, the physician is the key man of the medical-care team.

If medical education is to prepare future physicians for a type of practice in which management of the chronically ill or handicapped patient will loom larger, the medical schools should take steps to create the necessary attitudes by emphasizing the comprehensive evaluation and care of the patient. This can be done by demonstrating that such care involves not only all medical specialists, but also many associated professions concerned with the study of the individual and his adaptation to his environment.

It is not enough to tell the future physicians that one-sixth of the population is afflicted with some chronic disease and that care of such patients requires coordination of a complex array of facilities, personnel, and services. Rather, educational programs should be developed that allow the student to assume some responsibility for the care of patients with long-term illness, and thus require him to learn how to participate as a member of the health team. In this way, public and private agencies will exist not as vague abstractions the student hears about

from the social worker, but as realities necessary for the proper care of his patients.

A number of medical schools have now instituted programs designed to give the student first-hand experience in learning about the physician-patient relationship. These are more than efforts to "humanize science"; these are efforts to produce physicians capable of combining perception with knowledge in providing adequate health care.

Any program, such as one designed in relation to chronic disease, which would combine continuity with care, will furnish a setting in which the student can develop a sense of responsibility and learn the physician's role through participation. With instructors to sharpen his awareness and increase his understanding, the graduate might hopefully acquire those attributes and attitudes of the "good physician" desired by the consumer of health care—the public.

DR. SOLNIT: Dr. Jordan has described our subject, and has illustrated it by discussing our shortcomings in training physicians in the care of patients with chronic disease. He has challenged us to be explicit in facing this problem. Dr. Henry L. Barnett now will indicate the place our problem assumes in the health care of children.

DR. BARNETT: In a talk he gave recently in New York, Julian Huxley chose the intriguing Huxlian title of "What Are People For?" I had not planned to entitle my remarks for this afternoon, but if I had I think I might have borrowed Huxley's phrase and used "What Are Doctors For?" The implication is that, although community expectations for medical care need not be the sole or even major determinant of the content of medical education, it seems to me, the two must be related in some way. It is the community's expectations in the medical care of children that partially explain why many pediatric educators no longer question the necessity of teaching psychological factors involved in the physician-patient relationship.

The question is rather how the subject can be taught most effectively; I would emphasize, how it can be taught without hindering the teaching of the application of basic science to clinical medicine, since the basic function of the pediatrician is and must remain the care of sick children.

For the purpose of developing this thesis, and because some of the problems confronting pediatrics may not be known to all of my audience, let me pose these two questions: First, what does the community seek in terms of medical care for children in the United States today and how is it being provided? Second, how do these community expectations influence pediatric practice and pediatric education?

The community makes certain legitimate demands for medical care of children. Although these different aspects of pediatric care should not be separated, I have done so for the sake of my argument. The first of these is advancement in basic knowledge leading to specific treatment and prevention of disease. The second is diagnosis and treatment of major physical illness. The third is prevention of major physical illness and promotion and maintenance of optimal physical health.

These are the traditional functions of the pediatrician. When the community was seeking *only* these, most pediatricians, though not content with their knowledge, at least had the comfort that they were applying and trying to extend the knowledge they had acquired during their medical education. However, two additional demands are now being made with increasing frequency and intensity, and this brings us closer to the core of the matter.

The first of these is the diagnosis and treatment of children with psychologic illness and the provision of appropriate counsel for their families. As I shall mention later, I believe medical care in this area should be sought exclusively from the child psychiatrist and his team, but because of scarcity, economics, or prejudice, such help is sought often from the pediatrician. The other community expectation I want to mention is the prevention of psychologic illness and the promotion and maintenance of optimal psychologic health in children and their families. This aspect of pediatrics is occupying more and more of the pediatrician's time.

Although I have described these community expectations in terms of the medical care of children, they apply to adult medicine as well. Pediatricians may have become more conscious of them because pressures from the community for promoting optimal health at present are greater for children than for adults.

How have these factors influenced pediatric practice and how should they influence education in pediatrics? The major problem is that pediatricians have been trained to care for the physical aspects of infants' and children's ailments and yet many of the problems brought to them are essentially psychological and social ones for which they have not been trained adequately. In the future these problems may be handled by someone other than the pediatrician. At any rate the pediatrician is the one who is being asked to deal with them.

In this case what should be the additional ingredients of his education and training? I would be very happy if I knew, but I believe they should include at least the following two: (1) understanding and application of available basic knowledge not only of physical but also of emotional growth and development, which is probably the closest we can come at present to preventive psychiatry; and (2) understanding the importance of and having a working familiarity with available knowledge concerning the physician-patient relationship.

How can the latter be done most effectively? Again, I wish I knew. We have been exploring methods for many years and will continue to do so. Some isolated observations and suggestions have emerged which I should like to mention. First, whatever the so-called inherent capacity of the individual student for understanding the physician-patient relationship, I believe it can be heightened by education and training in this area. Who should do such teaching? I believe it requires not only sanction but participation in varying degrees by all of the teachers of medicine and particularly the chairmen of clinical departments. The single most effective influence we have found at our school is the presence in the department of a full-time, highly respected, senior faculty member, whose preparation for academic medicine has been mainly the experience he gained in the private practice of pediatrics. However, the pediatrician must not assume the role of the child psychiatrist. Although he can gain understanding and learn

techniques from the psychiatrist which I believe can make him a better pediatrician, his basic function is to care for physically sick children.

Another comment I want to make concerns the contribution of the child psychiatrist to this phase of pediatrics. I believe there are many ways in which the child psychiatrist can contribute if he is interested—which unfortunately is not always the case. At Yale, Dr. Solnit works in the department of pediatrics directly with students, interns, and residents. During the five years I have worked with Dr. Joseph Cramer, I believe the greatest single contribution he has made is teaching the *teachers* of pediatrics, who have then transmitted it to the pediatricians in training.

This leads to my last suggestion, which concerns the appropriate time for this type of instruction. I do not think many of us have had enough experience with the very reasonable suggestion of teaching behavioral sciences in the preclinical years to know how effective it might be. From our clinical experience, certain suggestions have emerged that may be important. One of these is that there be a continuing atmosphere of interest in the behavioral sciences from the student's first contact with patients. Finally, increasing attention should be given to this aspect of pediatric education and training as the physician progresses in his clinical experience, with the major emphasis being planned for the last years of his residency.

DR. SOLNITT: *In discussing the health problems of children and their families, Dr. Barnett has described how health needs are related to the community's expectations of health care. He has pointed out that there is no one approach to the problem, that new ways of attempting this integration of knowledge must be followed up, and that there be a critical scrutiny of it. At this point, we will go one step further and have Dr. Somers H. Sturgis discuss the impact of specialization on the physician-patient relationship from the point of view of a gynecologist.*

DR. STURGIS: In his address to the Second World Congress on Medical Education, Dr. Julius Comroe correctly and succinctly gave as his first assumption that a majority of medical students, now and in the foreseeable future, plan to enter specialty practice.² This is borne out in the statistics of this year's Institute workbook (see Chapter 3), where we find that of 1940-44 graduates nearly one of every two is engaged in general practice, whereas among 1950 graduates only one of three is so engaged.

It seems valid, then, to focus for a few minutes on this almost tidal swing toward specialization and consider whether any change may be brought about in the traditional relationship of the physician and his patient. What typifies the specialist? Are his goals different in any way from those of the general practitioner, other than the character of the service rendered?

A professor of surgery was once apt to advise his new interns in somewhat this fashion: "Don't ever forget that you are going to be trained to be a surgical specialist, so concentrate all your efforts towards being at the top in your own field. You can't expect to know every other aspect of your patient as well as your

² *Medicine—A Lifelong Study* (London: The World Medical Association, 1961).

colleagues do, for yours is professional proficiency in the knowledge and technique of surgery. Therefore, don't dilute your efforts by attempting to meddle in the nonsurgical aspects of each case. It's not your job to deal with the wishes and the emotional problems of Mr. and Mrs. John Doe. It is your job to be able to offer them a direct statement as to what the best surgical judgment dictates that an operation can or cannot do for them. On this ability of yours and on this alone will you be judged. Never forget that you are a surgeon first, last, and always."

This advice emphasizes the current problem, a point of view that can be applied to many specialties besides surgery. Can a specialist achieve the intimate contact with his patients represented by the old general practitioner and still maintain his superiority and his standing in his field? Is it possible for the present-day specialist to have the time and to care enough for his patients (to paraphrase Francis Peabody) to take care of them fully?

I have had long arguments with a colleague in my own specialty of gynecology from another city. He has tried to convince me that there is no need to be concerned about emotional complications that might result, say, from a hysterectomy procedure. He even suggests that my attempts to elicit from my patients their feelings about such a proposed operation are in fact putting anxiety into their heads. He tells me that he fixes his patients with a warm yet steely eye and says, "Madam, you will need to have a hysterectomy. Leave all the rest to me." This is all he says and all that he needs to say. He never gives them a chance to think of being concerned and feels that he never has patients with psychogenic difficulties due to this operation.

I have another respected colleague who routinely removes both ovaries whenever he does a pelvic operation on any woman who has completed her wished-for family, whether she is 35 or 45. Undoubtedly he is right when he says that his patients will not get cancer of the ovary when they are 50. He tells me that I am hypersensitive when I claim that removal of both ovaries in a young woman may produce catastrophic emotional illness. He says that he does not ask them if there are complications. If they ask him for help, he gives them stilbesterol pills and that is all that is necessary. I am afraid that he does not know too well what happens to his patients; some of them have come to me.

The converse of these attitudes in the specialty of gynecology stems from the broad concept that this science is founded on what we might call the study of "femaleness," the one characteristic that differentiates gynecologic patients from all others. Every symptom, and each method or measure utilized in therapy, clearly and inevitably affects this essential quality, the femaleness of the particular woman involved. Thus, this specialty, instead of a narrow discipline limited to diseases of the pelvic organs, broadens into a field that must necessarily include emotional, endocrine, social, and marital rehabilitation of the woman with a gynecologic complaint. The acceptance of the obligations implied by this concept demands a very close and rewarding relationship with one's patients.

There is no doubt at all that specialization is here to stay. This is the result partly of the huge increase in technological advances that must be taught to the student. It is no longer possible to embrace adequately the whole field of medical therapeutics. The best that the young physician possibly can hope for is to attain a measure of proficiency in one branch or another of the science of medicine. The

tendency toward specialization is also a result of the increasing availability of this care due to the greater mobility of the nation, the better roads, the ubiquitousness of a car in every family, the fact that a group practice or medical hospital or clinic is almost always within the reach of everybody in the country.

An enlightened public nowadays tends to demand the tests that they have read about, that can only be available in hospital centers. But does the public really know what it wants and what it is getting? Does the science, represented by a modern hospital, make up for the sympathy of the old family doctor of times gone by? Too often the patient in the charge of a physician in one of our teaching hospitals is only the mathematical point at the top of the pyramid. Who is going to take care of the patient?

Recently I saw a fine 70-year-old lady who needed a hysterectomy. After accepting my advice, she called up a few weeks later to say that she had decided to go to a small nearby hospital. She wished to go to the other institution because she knew an internist there who, she was sure, would drop in to see her each day. When I inquired who the surgeon was going to be, she said she did not know yet but she was quite sure that an adequate man could be found on the hospital staff. For her, science was not equated with sympathy.

I believe the public wants a thoughtful, humane doctor—the best in his field, of course—but primarily one who cares for each patient as an individual. I am not too sure that the public is going to get this sort of service from the young man who graduates from our supercharged medical school curricula and from the specialist residency training programs in force at this time.

There is too much to be learned these days. The technical aspects of surgical management demand every last minute of the intern's time. May there not be some justification for the advice that the trainee in a special field has no time to do more than concentrate on the technique of his specialty and leave to time, experience, fate, trial and error, or what have you, the less important factor of the human relationship between himself and his patients? Moreover, as more and more facts must be crammed into the four years of medical school, possibly with increasing time and emphasis on preclinical sciences, there may have to be a wider use of the didactic lecture to cover details of technique, complications, and statistical probabilities. This may be done by the full-time professor, such as the surgeon whose advice I paraphrased at the start of my talk.

May it not be equally important to give experienced clinicians as much time in our training curricula to teach aspects of dealing with patients and inculcate the human values embodied in the physician-patient relationship? There can be no turning back from the trend towards specialization; yet this creates another additional burden on the teachers of the new generation of doctors.

It is just as important to keep pace with this trend by giving time continually to emphasize that the patient is a person, an individual with his concerns and worries, with his own fears and fantasies of the results of his illness. There should be no substitute for the precept of medical training that our students must learn to be physicians first, last, and always, and only specialists second.

DR. SOLNIT: Dr. Sturgis has pointed out that we need to be able to exploit the advances inherent in specialization at the same time as we exploit our increased

knowledge about psychological aspects of patient care. Now we will hear from Dr. Leighton E. Cluff, who will discuss what happens if you do the wrong thing or omit important psychological considerations.

DR. CLUFF: I shall begin my presentation with a brief description of three patients.

Case A

A young man went to a physician for a life-insurance examination. The doctor took his pulse and tested his heart and, in doing so, looked at his watch, shook his head and said, "Dear, dear." The patient was convinced that this was his death sentence. His mournful reflections on his heart disease so turned his mind that eventually he came under the care of a psychiatrist. The psychiatrist investigated the matter and, knowing the insurance examiner, rang him up and asked what was organically wrong with this young man. "Sound as a bell," was the reply. "But he says," the other went on, "that when you examined him you looked at your watch, shook your head, and said, "Dear, dear." The doctor reflected a moment and then said, "So I did. I looked at my watch and found that the darned thing had stopped again."³

Case B

Now I should like to quote from a letter I received a few months ago.

GENTLEMEN:

This letter is born of desperation and hope. Nineteen years ago I became ill in a way which to me was very strange. The symptoms were vague, distant, and confused. There was no pain. When this illness first occurred, it lasted approximately 10 days. Thereafter, it returned about every 21 days and lasted 4 days.

There are periods between these spells when I feel waves of this malady which vary in length from a few minutes to a few days, but are of no great severity. These attacks, for the last 12 or 14 years, have not varied in duration, always from 13 to 15 days. I never have fever. In fact, I don't think I have had fever with any illness in the last 12 years.

Since a short time after this illness occurred, I have had a constant pain in the back of my neck which at times is quite bad. I think this causes some severe headaches.

A brief history of various diagnoses: Malaria in 1939-41; electric shock treatments, 1941—I'll never submit to this therapy again; psychosis undetermined, 1942; psychoneurosis anxiety state, moderate, 1944. A doctor at the ——— in 1946 considered my case of a psychiatric nature.

Then, about 6 years ago, I got my first big break: a correct diagnosis, undulant fever, found by an agglutination test and, yet, no treatment has produced significant results, not even aureomycin.

You can understand how difficult it is for me to provide for my family, and that I need help! In 1940-41 I had to leave ——— University, where I was pursuing hopes for a career in medicine. In 1942 I washed out of aviation cadets at ——— Field. In 1943 I got an appointment from the ranks to ———, only to be medically discharged in 1944. In 1948 I failed in farming. All of these disappointments came as a result of the undulant fever.

Case C

A young boy was operated on for congenital heart disease, and was given prophylactic penicillin and streptomycin. Postoperatively he began to develop

³ From *The Quiet Art: A Doctor's Anthology*, compiled by Robert Cooke (Edinburgh and London: E. and S. Livingstone Ltd., 1952).

fever, and a diagnosis of bacterial endocarditis was entertained. As a consequence, additional drugs were given but no confirmation of the diagnosis became available.

The boy's fever continued to rise, and he lost weight and became very ill. After six weeks had elapsed, it was decided that he might not have bacterial endocarditis after all and, after consultation, drug fever was suspected. His therapy was withdrawn; his fever immediately dropped within less than twenty-four hours, and his clinical improvement was so dramatic that within three days he was able to be discharged from the hospital, and he returned home.

What do these three patients have in common—the sound patient with anxiety about cardiac symptoms, the patient with a serious emotional disturbance who attributes all of his ills and misfortunes to undulant fever, the young boy and his therapy-induced fever?

The link between them is that each is an example of iatrogenic disease, differing only in the manner in which the physician induced the illness. The first is an instance of iatrogenic heart disease, and many reports have shown that about 10 per cent of the patients who consult a cardiologist may have symptoms attributable to this cause. Although not all instances of iatrogenic heart disease have been precipitated by a comment as casual as "dear, dear" accompanied by a glance at one's watch, the fact remains that injudicious discussions with the patient or incompetent professional decisions can cause symptoms of illness.

The second instance I cited is somewhat different, although at first glance it may not seem to be. Here we have a patient, suffering from a serious emotional disease, who has clutched at a diagnosis of chronic brucellosis with such fervor that it is doubtful he will effectively avail himself of psychiatric treatment. It would seem that in this case an incompetent decision was the source of the iatrogenic disease. Yet, it is not possible to dispute that the patient did indeed once have acute brucellosis. The difference between the first case and this one, then, lies in the perpetuation of the patient's symptoms. This consequence is almost certainly psychological in origin, resulting in part from the unhappy inability of the physician in Case B to see that the diagnosis had enabled the patient to relate his complaints to an organic disease that he did not have. The physician's lack of understanding of the real meaning of a patient's symptoms can be the instrument for introducing an iatrogenic illness.

The third case is of an entirely different order from the others in that therapy induced an iatrogenic illness. Regardless of justification, the drugs given by the physician were responsible for the patient's long hospitalization, his debility, and a prolonged financial and emotional ordeal for the boy's family.

We all know that a good physician can influence a sick patient beneficially, whether it be by relieving anxiety, by giving proper treatment or care, or by gaining the patient's confidence. It is to that end that we, as doctors of medicine, are trained and are dedicated in the training of others. But obviously, since we are faced with the reality of iatrogenic illness, preparing the student and the young physician to help his patient is not enough; we must also so prepare him that he will not harm his patients. The question is: How?

The answer is not a simple one, since it involves the most careful consideration

of all of the elements, all of the facts, all of the intuitive insights that comprise the practice of medicine. Of these, I believe the most important element is supervised experience. By providing the student and house physician with experiences that will give him the opportunity for close acquaintance with the science of medicine we can help him to avoid mistakes spawned by a lack of knowledge. Errors in judgment are more easily forgiven than errors of ignorance. But even judgment, conditioned as it is by social, economic, and psychological factors, as well as by attitudes, interests, and sensitivity, can be formed and sharpened by experience. So the provision of meaningful experience, along with its necessary corollaries—enlightened guidance and instruction—is of the first order of importance.

Of one thing I am certain. In order to be of the greatest benefit to his patients, to his profession, and to those who follow him in it, the physician must avoid the possibility of inducing iatrogenic disease. To do so he must learn to recognize his errors and so avoid their recurrence. He must impart his learning with candor, without standing behind the mask of authoritarianism, empiricism, or overconfidence. He must, in a word, be honest with himself, treating his medical practice as a science, using the methods of science to broaden his knowledge, his judgment, and his understanding.

In conclusion, let me add that without the science of medical practice the art of medicine is inadequate, and the art of medicine can be significantly improved through the application of medical science. It is important for us to remember that in consideration of the physician-patient relationship we cannot dissociate the science of medical practice from the psychological, sociological, and economic aspects of the art of medicine.

DR. SOLNIT: Dr. Cluff has pointed out some ways of misusing and abusing psychological factors involved in the physician-patient relationship. At this point, Dr. Jonathan E. Rhoads will conclude our panel by bringing us back to a pointed discussion of the art and science of patient care.

DR. RHOADS: Discussions of education remind me a little bit of a situation that a friend of mine encountered during the period when he was studying for the ministry. One day he went to visit his elderly Aunt Mary, who was a rather pious person; she belonged to a Bible club where she met once a week with some of her contemporaries to discuss sections of the Bible. He asked her what section they were studying that winter and she told him Revelations. He said, "Well, Aunt Mary, that is one of the most difficult sections of the Bible to study. Don't you have a little trouble understanding it?" She said, "Oh, yes; we have a good deal of trouble understanding it, but when we do we just explain it to each other."

Our Teaching Institute is concerned primarily with teaching, particularly with teaching medical students, interns, and residents. This session, like so many sessions in the past three or four decades, recognizes that medicine is an art as well as a science. As we all know, there have been tremendous developments in medical education in teaching the science of medicine, but we are still perplexed about teaching the art. One thinks immediately of the statement attributed to Hippocrates, "The art is long." This suggests strongly that Hippocrates, likewise, knew

of no quick way to teach the art of medicine and that he and the physicians of his time were aware that this was a slow and gradual process.

One of the differences between an art and a science is that the science may be transmitted by words, either spoken or written, but the art, by its very nature, cannot be transmitted entirely by words. Art implies active exercise on the part of the learner—in other words, actual experience and practice. Thus it seems out of the question to teach the art of medicine to any extent before the student comes into contact with the patient. Didactic material should not be expected to transmit the art of medicine but merely to tell the student a little about how to acquire this art as he enters practice.

There are two main branches of the art of medicine—and here I define art perhaps a little differently from that which we have been thinking of—one of which I will call “neural” training and the other psychological training. Thus, learning palpation, percussion, auscultation, and inspection is “neural” training. Surgical, endoscopic, and laboratory techniques, in which muscular control plays a role, depend predominantly on “neural” training, though they involve motor as well as sensory functions.

The other main division of the art of medicine is psychological. It is concerned with lowering the barriers that make it difficult for the patient to talk. It is concerned with interviewing—which by the way, is a dreadful term for listening to and talking with the patient. It is concerned with value judgments. There are the attitudes of the patient; there are the attitudes of his wife; there are the attitudes of the social group of which he is a part. There are one's own attitudes, which may have to be discounted. Furthermore, the psychological side of the art of medicine is concerned with the decision-making process. The decisions to be made in medicine are legion. Most of them are unimportant, and yet a failure to make them becomes important. Some of them are extremely important, as important as life itself.

The efforts to teach the art of medicine tend to push the teacher in the direction of codifying his experience, trying to reduce it to principles that will make suitable capsules for the student to swallow. It is quite possible to lose more than one gains in such attempts because they may deceive the student into thinking that he can acquire the art of medicine in capsule form. Fortunately, most students are not as inclined to fall in with this as are some teachers. For the most part, they realize that the acquisition of the art of medicine must in substantial measure be acquired on a do-it-yourself basis.

There is perhaps no more concrete example of problems in the art of medicine than those that can develop out of a case of a lump in the breast. The physician must recognize the tremendous amount of publicity about breast cancer appearing not only in the newspapers, which his patients probably read more carefully than he does, but also in general magazines and particularly in women's magazines which he may never see. All this publicity will have had a great impact, both directly and indirectly on his patient. She may be the kind of patient who faces a problem and comes to grips with it and will not be deterred from appropriate action. On the other hand, she may be the kind of person who finds it difficult to face problems and seeks all sorts of escape mechanisms rather than to come to grips with something very unpleasant.

How much can this be assessed in an initial interview? Some assessment, to be sure, must be made. If the patient is told that the lump is almost certainly benign but should be removed, she or her family may decide that you are recommending an unnecessary operation. On the other hand, if you say that the lump very likely is malignant and should be dealt with immediately, time and again the patient will leave your office forever and seek out physician after physician until she finds someone who will give her more comfort, darning you as a psychological brute wherever she goes.

The objective is clearly to help the patient do what is medically correct with as little grief and turmoil as possible. At the same time one recognizes that, if the patient does not face the problem before operation, the problem after operation is likely to be greatly multiplied.

In order to inculcate this type of experience, it is exceedingly advantageous for the student to work more or less singly with a preceptor. In a great majority of medical situations, you can take one more person along as a professional assistant. However, if you have two people besides yourself, the patient is somehow on display and the relationship is changed.

Medical educators of the past generation have been critical of the preceptorship type of training as opposed to more formal programs, and I am sure that it has left much to be desired. However, I believe that some experience as a preceptee is immensely valuable in learning the art of medicine.

Therefore, although courses in psychology, sociology, and the other behavioral sciences may well contribute toward making a science of the art of medicine, I contend that it will always involve a healthy proportion of firsthand experience.

DR. SOLNIT: It seems to me that we have been tantalizing you by offering very brief—at times anecdotal—and provocative statements about the physician-patient relationship at various levels of medical education. We are hoping that you will discuss many of these points extensively in later sessions.

When the physician is aware of the patient's motivation, of the impact on the patient's life of earlier experiences (especially repetitive ones or experiences that are a crisis for the patient's development), he will have a basis for understanding the patient. This will include the history of important attitudes of the patient, including the attitude toward the physician.

Eliciting a history and performing a physical examination are not difficult. The challenge is to elicit a valid history, and you cannot elicit the valid history of a person's life or his health problems unless you have a way of explicitly making the relationship between physician and patient a therapeutic one, one that relieves rather than exacerbates in the context of the physician-patient relationship. Temporarily there may be exacerbations or discomforts, but what we are talking about is the eventual result.

It is important to consider that medical education does have an impact on the character formation of medical students and house officers. This is important and not to be treated lightly, but it is not sufficient when thinking about the physician-patient relationship. We are talking about the science of psychological medicine in which observations are made, codified, and scrutinized critically, of how one person, the physician, influences and is influenced by another person,

the patient. This is more than character formation and not to be compared to it. It is important but not sufficient to be compassionate. The physician must also have knowledge about the deliberate use of psychological factors that influence the patient and himself. For example, the internship is an extremely formative experience in developing the professional character of the individual. However, an awareness of the formative influence of medical training will not guarantee the physician's competence in establishing and utilizing the physician-patient relationship. We have to help the trainee learn explicitly the psychological factors involved in the diagnosis and treatment of the patient.

In fact, where we fail to help the trainee learn about the potent psychological forces contained in the processes of the physician-patient relationship, we may have reinforced his tendency to become cynical rather than skeptical, discouraged rather than challenged, and frustrated rather than effective in his daily work and development as a clinical scientist.

CHAPTER 11

Physician Opinion on Education and the Physician-Patient Relationship

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This paper reports the results of a questionnaire circulated to the 1950 graduates of United States medical schools. The study sought primarily to explore how and during what period in his medical education today's young physician learned to handle the physician-patient relationship. It also elicited expressions of opinion about deficiencies in the medical school curriculum. Results show, among other things, that most of these physicians did not learn the physician-patient relationship through formal teaching but by observation during medical school and by trial and error after graduation. Other results suggest the need for flexibility in the medical curriculum and the need for some emphasis on medical economics.

HOW DID today's younger physician learn to work with patients? How adequate were his opportunities—during medical school, during the internship, during residency—for acquiring the skills that the physician needs in his day-to-day task of understanding, communicating with, and maintaining the confidence of those individuals whose physical ills he must treat? What major deficiencies does the practicing physician see in his medical school education as he looks back upon these experiences in the light of his subsequent career? These are three questions that were raised by the 1959 Institute Subcommittee concerned with the problems of teaching responsibility for patient care. Committee members were interested in finding out if young physicians just getting firmly established in their practices felt the same kinds of concerns that they, the committee members, felt about present-day clinical teaching.

To obtain information on the topic, a questionnaire (see Appendix C) was sent to a sample of physicians who graduated from medical school in 1950. Before looking at the responses that were received, let us examine some of the characteristics of the individuals included in the sample.

Characteristics of the sample

Questionnaires were sent to 2594 individuals, a 50 per cent random sample of the 1950 medical school graduating classes.¹ Of these, 1953 (75 per cent)

¹ We wish to express our thanks to the Council on Medical Education and Hospitals of the American Medical Association for providing the names and current addresses of these physicians.

TABLE 11.1
AGE, TYPE OF CAREER, AND
SPECIALTY BOARD CERTIFI-
CATION OF PHYSICIAN
RESPONDENTS

Classification of physicians	N	%
<i>Age group</i>		
Over 43 years	104	6
37-42 years	885	45
Under 37 years	964	49
Total	1953	100
<i>Type of career</i>		
General practice	597	31
Specialty practice	874	45
Combination of specialty practice and teaching and/or research	355	18
Teaching and/or research	86	4
Other	36	2
Undetermined	5	*
Total	1953	100
<i>Certification status</i>		
Certified	510	27
Not certified	1444	73
Total	1953	100

* Less than .5 per cent response.

returned usable questionnaires in time to be included in the analysis. Taxonomies used to determine representativeness of the sample and to permit inquiry into the environmental correlates of the opinions expressed by this group are tabulated in Table 11.1. Only one of these taxonomies, specialty board certification, requires special comment. On the basis of information obtained from the American Medical Association records, physicians were classified into two groups, those who had been certified by one or more American Boards and those who had not been certified. Physicians whose AMA records indicated they were residents, and who reported on the questionnaire that they had completed four or more years of residency training, were classified as certified. (It was assumed that most of these individuals are now certified, and their records have simply not caught up with them. The few who may not be certified are nonetheless more appropriately classified with this group than with others who have had less post-graduate training.)

The results of the tests performed to determine the representativeness of this sample are shown in Appendix C. We have used as our base the 50 per cent straight random sample of 1950 graduates to whom questionnaires were sent, assuming that this random sample is representative of the total population. The data indicate that those physicians who responded were generally somewhat younger and had achieved higher status in the profession (as measured by the proportion certified and the proportion in specialty practice careers) than their nonresponding colleagues. With a sample as large as this, slight differences in distributions are almost always statistically significant, however. Practically speaking, there are adequate numbers of representatives of each age group and type of career to permit the development of their points of view. Where responses are correlated with age or type of practice, however, the differences between groups will be underestimated. This report, then, will lack full representation of the viewpoints of older, less successful, and probably less able general practitioners.

TABLE 11.2
WAYS IN WHICH PHYSICIAN-PATIENT RELATIONSHIP WAS
LEARNED DURING AND AFTER MEDICAL SCHOOL

(Multiple response)

Physician-patient relationship learned by:	During medi- cal school		After medi- cal school	
	N	%	N	%
Observing instructors	956	49	659	34
Formal instruction	306	16	205	10
Trial and error	355	18	1305	67
Other	77	4	187	10
No response	387	20	76	4
Total	1953		1953	

TABLE 11.3
METHODS BY WHICH PHYSICIAN-PATIENT RELATIONSHIP WAS LEARNED
BY PHYSICIANS IN VARIOUS TYPES OF PRACTICE

(Multiple response)

Physician-patient relationship learned by	Type of practice									
	General practice		Specialty practice		Specialty practice, teaching- research		Teaching and/or research		Other	
	N	%	N	%	N	%	N	%	N	%
During medical school										
Observing instructors	288	48	415	47	179	50	51	59	19	53
Formal instruction	100	17	146	17	45	13	13	15	2	6
Trial and error	103	17	151	17	76	21	18	21	7	19
Other	29	5	26	3	16	5	5	6	1	3
No response	131	22	182	21	59	17	3	6	9	25
After medical school										
Observing instructors	156	26	343	39	128	36	19	22	11	31
Formal instruction	66	11	101	12	32	9	1	1	4	11
Trial and error	450	75	356	64	210	59	62	72	23	64
Other	60	10	77	9	40	11	5	6	4	11
No response	28	5	25	3	12	3	7	8	4	11
Total	597		874		355		86		36	

How was the physician-patient relationship learned?

During medical school most 1950 graduates apparently developed their skills in dealing with patients primarily by observing the way in which instructors handled their patients (Table 11.2). After medical school they relied primarily on their own trial and error experiences. Of the three methods of learning suggested in the questionnaire, the one considered least important both during and after medical school was formal instruction. It is clear that prior to the early 1950's, at least, little in the way of effective formal education in the science and/or art of working with patients was offered in United States medical schools.

Patterns of response differ little among age groups, although the older students among the 1950 graduates were somewhat more prone to observe their instructors' methods during medical school than were the younger students;

TABLE 11.4
OPPORTUNITIES FOR LEARNING
PHYSICIAN-PATIENT RELATION-
SHIP DURING VARIOUS
TRAINING PERIODS

Learning opportunities	Training period					
	Medical school		Internship		Residency or fellowship	
	N	%	N	%	N	%
Excellent	330	17	544	28	764	51
Good	585	31	728	38	485	32
Fair	652	34	451	24	191	13
Poor	340	18	189	10	55	4
Total	1907	100	1912	100	1495	100

possibly because they were older and undertook less postgraduate training, relatively fewer of them learned by observation after medical school.

Physicians pursuing different medical careers vary in the extent to which they lay claim to learning by one or another technique (Table 11.3), although within each group, the most popular method during medical school is always observation and after medical school, trial and error. That observation is not more extensively utilized by specialty practitioners after medical school is somewhat puzzling. Since these individuals have clearly spent a good deal of time in residency training, it is suggested that instructors' techniques may have been rejected in favor of trial and error by substantial numbers. Opportunity, or lack of it, undoubtedly plays a more important role in methods employed by general practice and research groups.

Opportunities for learning physician-patient relationship during various training periods

If the physician-patient relationship is learned primarily by trial and error and by observation of others, one might speculate that the training periods subsequent to medical school would provide the greater opportunity for acquiring these skills. The data shown in Table 11.4 tend to substantiate this hypothesis. Over half of the physicians who evaluated the residency and fellowship indicated that the opportunities for learning how to establish good physician-patient relationships were excellent during this period, as opposed to only 17 per cent who felt that opportunities had been excellent during medical school.

Opportunities for learning the physician-patient relationship during medical school were rated as excellent somewhat more frequently by older individuals, but the younger physicians were more likely to give their residency and fellowship training an excellent rating than the older group (Table 11.5). Note that a relatively smaller proportion of the latter undertook residency training. After medical school the group that was most satisfied with the training they had received in the physician-patient relationship was the middle group, those who were between 29 and 35 years old during their internship.

No significant difference was found between the opinions of certified and noncertified individuals with respect to opportunities for learning the physician-

TABLE 11.5
OPPORTUNITIES FOR LEARNING PHYSICIAN-PATIENT
RELATIONSHIP DURING VARIOUS TRAINING PE-
RIODS ACCORDING TO AGE OF RESPONDENT

Learning opportunities	Present age					
	30-36		37-43		44 or older	
	N	%	N	%	N	%
During medical school						
Excellent	138	15	167	19	25	25
Good	275	29	272	31	38	38
Fair	350	37	279	33	23	23
Poor	175	19	151	17	14	14
Total responding	938	100	869	100	100	100
During internship						
Excellent	239	25	277	32	28	28
Good	360	39	325	37	43	42
Fair	236	25	190	22	25	25
Poor	105	11	79	9	5	5
Total responding	940	100	871	100	101	100
During residency or fellowship						
Excellent	405	51	334	54	25	40
Good	268	33	198	31	19	31
Fair	104	13	72	11	15	24
Poor	26	3	26	4	3	5
Total responding	803	100	630	100	62	100

TABLE 11.6
OPPORTUNITIES FOR LEARNING PHYSICIAN-PATIENT RELATIONSHIP
DURING VARIOUS TRAINING PERIODS ACCORDING TO
PHYSICIAN'S TYPE OF PRACTICE

Learning opportunities	Type of practice									
	General practice		Specialty practice		Specialty practice, teaching-research		Teaching and/or research		Other	
	N	%	N	%	N	%	N	%	N	%
During medical school										
Excellent	100	17	123	14	74	21	27	33	5	15
Good	159	27	283	33	98	28	32	39	9	27
Fair	202	36	298	35	121	34	18	22	13	40
Poor	118	20	152	18	59	17	5	6	6	18
Total responding	579	100	856	100	352	100	82	100	33	100
During internship										
Excellent	195	34	210	24	102	29	31	38	4	12
Good	221	38	335	40	125	35	28	35	19	58
Fair	123	21	217	25	87	25	14	18	8	24
Poor	43	7	98	11	38	11	7	9	2	6
Total responding	582	100	860	100	352	100	80	100	33	100
During residency or fellowship										
Excellent	85	38	437	51	194	57	37	58	10	42
Good	90	41	266	32	99	29	18	29	10	42
Fair	37	17	109	13	36	11	5	8	3	12
Poor	10	4	30	4	11	3	3	5	1	4
Total responding	222	100	842	100	340	100	63	100	24	100

TABLE 11.7
MOST DEFICIENT AREAS IN MEDICAL SCHOOL CURRICULUM

Most deficient area	N	%
Basic medical sciences	132	7
Application of basic sciences to clinical problems	505	26
Practical clinical experience	346	18
Practical instruction in the doctor-patient relationship	701	35
No response	269	14
Total	1953	100

TABLE 11.8
**MOST DEFICIENT AREAS IN MEDICAL SCHOOL CURRICULUM
ACCORDING TO PHYSICIAN'S TYPE OF PRACTICE**

Most deficient area	Type of practice									
	General practice		Specialty practice		Specialty practice, teaching-research		Teaching and/or research		Other	
	N	%	N	%	N	%	N	%	N	%
Basic medical sciences	16	3	66	8	28	8	21	25	1	3
Application of basic sciences to clinical problems	100	17	246	28	112	32	33	38	10	27
Practical clinical experience	140	23	135	15	57	16	13	15	1	3
Practical instruction in the doctor-patient relationship	249	42	308	35	114	32	12	14	18	50
No response	92	15	119	14	44	12	7	8	6	17
Total	597	100	874	100	355	100	86	100	36	100

patient relationship, but rather sharp differences were found among physicians in different types of practice (Table 11.6). The teaching-research group rated all three training periods higher than any other group, and were most different from the other groups in their ratings of the opportunities afforded by their medical schools. Since a few medical schools develop the large proportion of future teacher-researchers, this difference in ratings is at least partially a function of differences between schools. Another part of the variation is a function of differences in the characteristics of individuals selecting different types of careers.

Deficiencies in medical school experiences

When asked to indicate which one of four areas was most deficient in their medical school education, about one out of three respondents selected practical instruction in the physician-patient relationship (Table 11.7). The next most deficient area was the application of basic medical sciences to clinical problems, cited by about one-fourth of the sample.

The data show that the need for more instruction in the physician-patient relationship is expressed about equally often by physicians at all age levels, but older individuals were somewhat more likely to indicate that their medical school experiences had been deficient in the amount of practical clinical experience offered than their younger colleagues. Deficiencies in basic medical sciences and in the application of these to clinical problems were cited about equally often by all age groups.

TABLE 11.9
AREAS IN NEED OF GREATER
EMPHASIS DURING MEDI-
CAL SCHOOL

(Multiple response)

Area	N	%
Techniques of managing minor psychiatric disorders	803	41
Legal medicine	614	31
Community health resources	266	14
Economics of medical practice	1238	63
Medical ethics	463	24
Other	196	10
No response	199	10

As one might expect, physicians whose major concern lies with the practice of medicine (general practitioners and those in full-time specialty practice) indicated practical instruction in the physician-patient relationship as the most deficient of the four areas much more frequently than those in academic medicine (Table 11.8). On the other hand, the teacher-researcher is most likely to feel his background in pure or applied basic medical sciences is his most serious deficiency (a total of 63 per cent of the teaching-research physicians indicated these two areas). The doctor who combines a specialty practice with teaching and/or research resembles other practitioners with respect to his need for more instruction in the physician-patient relationship, and his apparent lack of concern about instruction in the pure basic medical sciences. However, he shares with his academic colleagues the need for more instruction in the application of basic sciences to clinical problems.

Other areas in need of greater emphasis during medical school

In addition to comparing the four areas discussed above, the physician was asked to indicate other areas he thought were in need of greater emphasis during medical school. In answering this question he was instructed to check any or all of the areas listed in the questionnaire and to add any that were not listed. Therefore, all tables pertaining to this question are multiple response tables in which percentages add to more than 100 per cent.

The economics of medical practice have obviously created problems for about two-thirds of the 1950 graduates and, as might be expected, the general practitioners most often felt that this area should be given greater emphasis during medical school (Tables 11.9 and 11.10). The next most often cited need for emphasis was the area of techniques of managing minor psychiatric disorders, which was indicated by about four out of ten individuals. About one-third felt that legal medicine needed greater emphasis and one-fourth were concerned about medical ethics. Relatively few, 14 per cent, felt a need for more emphasis on community health resources.

No significant differences were found among the opinions of physicians at different age levels regarding this question, and only slight differences were found between the opinions of the certified and noncertified groups, i.e., somewhat larger proportions of the noncertified group felt the need for more emphasis on minor psychiatric disorders and medical economics.

TABLE 11.10
AREAS IN NEED OF GREATER EMPHASIS DURING MEDICAL SCHOOL
ACCORDING TO PHYSICIAN'S TYPE OF PRACTICE

(Multiple response)

Area	Type of practice									
	General practice		Specialty practice		Specialty practice, teaching-research		Teaching and/or research		Other	
	N	%	N	%	N	%	N	%	N	%
Techniques of managing minor psychiatric disorders	289	48	338	39	137	39	19	22	18	50
Legal medicine	193	32	319	36	98	28	19	22	13	36
Community health resources	77	13	97	11	71	20	11	13	9	25
Economics of medical practice	422	71	569	65	197	55	27	31	20	56
Medical ethics	132	22	210	24	98	28	15	17	4	11
Other	56	9	71	8	45	13	15	17	7	19
No response	40	7	91	10	45	13	19	22	4	11
Total responding	597		874		355		86		36	

Age and certification status are not correlated with responses to this question. Response patterns of individuals following various types of careers, however, differ considerably (Table 11.10), again reflecting the different needs of the practicing physician and the academician. General and specialty practitioners more often than teacher-researchers felt the need of emphasis on management of minor psychiatric disorders and medical economics. Relatively fewer academicians felt that any of the areas suggested in this question were badly in need of additional emphasis, but they suggested other areas such as research methods and specific basic science courses.

Summary

The questionnaire circulated to 1950 graduates of United States medical schools sought to explore how and during what period in his medical education today's young physician learned to handle the physician-patient relationship. It also elicited expressions of opinion about deficiencies in the medical school curriculum.

Judging from the patterns of these physicians' responses, it is apparent, first of all, that formal teaching played an insignificant role in the development of skill in physician-patient relations for all but a few of those trained in the late 1940's and early 1950's. Our physicians tended to learn by observation during medical school and by trial and error after graduation. Since the majority rated their postgraduate learning opportunities higher than they did their opportunities during medical school, we are led to believe that these physicians are more satisfied with their trial-and-error experiences than with what they learned by observation. That this state of affairs is not considered desirable, however, is demonstrated by the extent to which practical instruction in the physician-patient relationship is cited as having been the most deficient of several areas of medical school instruction by those physicians who emphasize medical practice in their present careers.

For specialists, and increasingly for those graduates who emphasize research in their careers, lack of instruction in methods of applying the basic sciences to

clinical problems is considered the medical schools' greatest deficiency. The full-time teacher-researcher, in contrast to others, is often most frustrated by deficiencies in his pure basic science education.

Clearly, the demands of different types of careers create variations in patterns of needs, and hence in opinions about deficiencies and desirable emphasis in the medical school curriculum. In the final analysis, then, the results of this questionnaire point up a not so old, but very familiar concept—the need for flexibility in medical school curricula. Even among physicians following similar careers expressions of needs differ, and these are no doubt related to differences among schools as well as to differences among characteristics of individuals. Since most schools expect to prepare students for diverse careers, however, the need for flexibility in any one school's curriculum is apparent. Greater efficiency in the fulfillment of individual needs might also be achieved if some differentiation with respect to type of career were made earlier in the physician's education.

One final word about the pervasive need for emphasis on the economics of medical practice. The report of the 1958 Teaching Institute² contains discussions by Dr. Charles G. Child, III, and by Dr. Seymour Harris which reflect the dynamic quality of present-day medical economics. These papers suggest that understanding will not be made accessible by means of a few scattered hours of lecture.

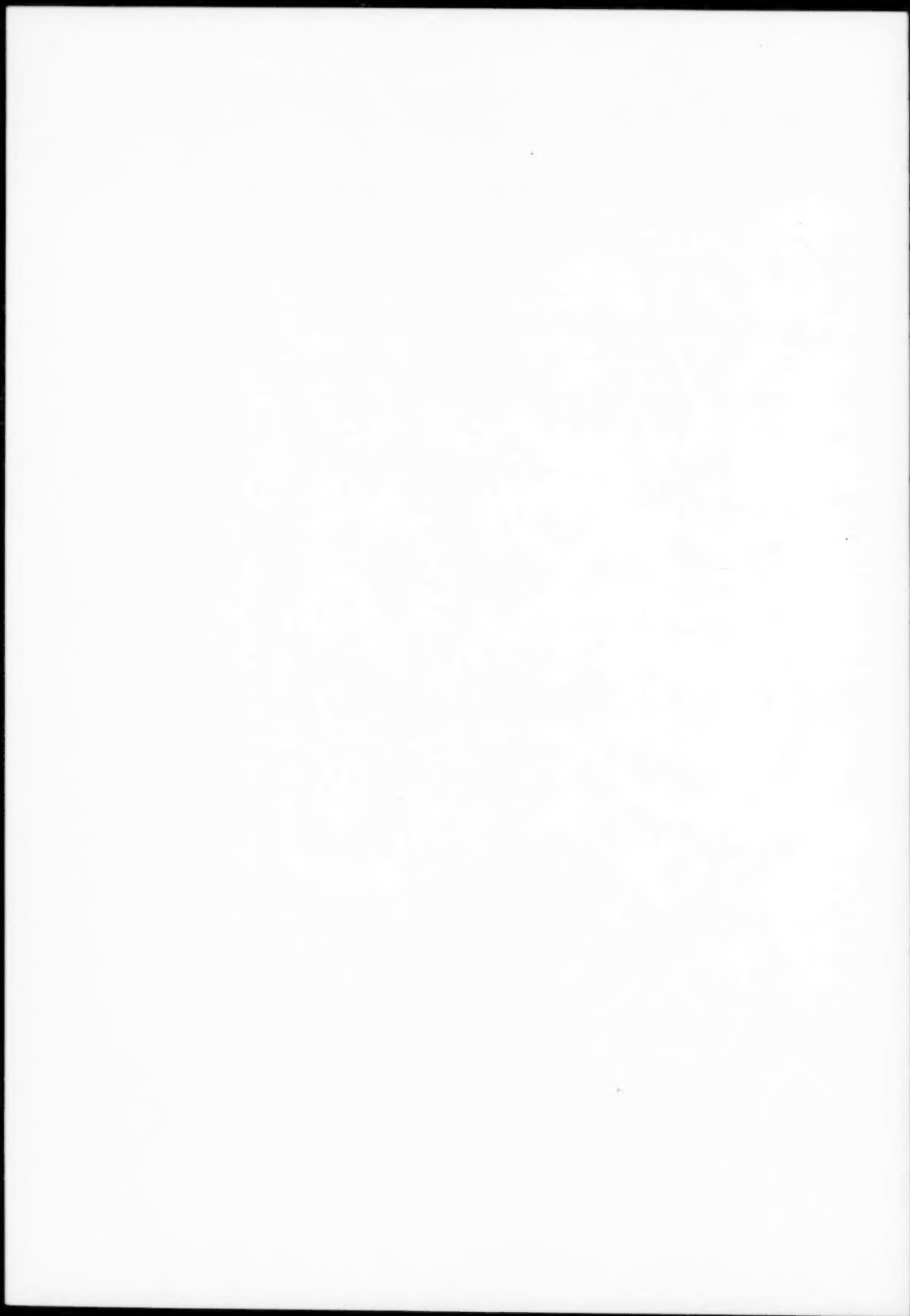
² Gee, Helen Hofer, and Richmond, Julius B. (eds.), *Report of the First Institute on Clinical Teaching* (Evanston, Illinois: Association of American Medical Colleges, 1959), pp. 35–46 and 125–35.



PART IV

A Symposium on Professional Education

Chapter 12. <i>Some Aspects of Professional Education</i>	PAGE
by Moody E. Prior	167
Chapter 13. <i>Physicians, Scientists, and Engineers</i>	
by Lee A. DuBridge	174



CHAPTER 12

Some Aspects of Professional Education

BY MOODY E. PRIGR

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Education for the professions loses a great advantage if it fails to capitalize on the student's tremendous motivation toward becoming proficient in his special field. A major problem besetting professional education is that of preserving enthusiasm while preventing the development of rigid narrow professionalism. Two general educational objectives should be kept in mind: (1) to provide not only specific information but also an understanding of the underlying concepts of the field; (2) to emphasize the contributions that can be made by other branches of learning, thus helping the student to understand and appreciate the place of his profession in relation to the broadest concepts of science, the organization of society, and man. Putting into use such concepts would make possible a new kind of insight, broader in scope, and would allow exercise of imagination, freeing an individual from the pedantic limits of professional conduct.

THE PROBLEM of training an individual for one of the professions has become so involved and has vexed people to such a degree that the mere word "professionalization" has now come to imply that strong motivation toward training for a profession is somehow an educational misfortune. In all this concern with the defects of professionalism, however, certain things have been forgotten. Let me speak as the advocate of the devil for a moment and remind ourselves of some of them.

The dilemma of professional emphasis in education

In the first place, training for a profession takes advantage of one of the most profound motivations toward the acquisition of knowledge. There are few things that urge an individual on and prompt him to devote his time unflaggingly to learning as effectively as a determination to become a member of some profession—an engineer, a scholar, a teacher, a lawyer, or what not. Once that idea gets into a young person's mind, and gets into it deeply, there are very few things that can stop him—neither poverty, nor hard work, nor dalliance—he can survive almost anything. This is a very profound drive, and I do not think we can afford to discourage the kind of enthusiasm and channeling of emotional and intellectual energies such an aspiration brings about.

The factors that lead a man to choose a profession and devote himself to it may sometimes be very trivial. I would not be surprised if there is a young boy of ten years somewhere in this city at this moment reading the comic strip "Rex Morgan" in the evening paper who, 25 years from now, may be a great surgeon

in consequence. It does not make much difference what the initial motivation is, because very few people at the beginning of life can appreciate and indulge in the pure contemplation of learning and in the cultivation of excellence for its own sake. The motives may improve with age. Therefore, a person who starts out quite young with a determination to be a physician should not be discouraged on the assumption that this bias will inhibit his proper intellectual growth. His enthusiasm and determination are something we can capture and build upon.

One virtue of an early leaning toward a profession is that learning anything, mastering any skill, can best be acquired when the requisite attitudes and techniques become part of us at an early age. For instance, if a person is going to spend his life working with instruments, he might well develop a feel for them early, so that in time they become an extension of himself. All of us are familiar with the ease with which children learn foreign languages or the way in which young boys pick up very complex technical knowledge about some hobby and use the vocabulary familiarly. As these children grow up, the foreign language or the technical language are not alien, but something they feel in their bones. When one begins to apprehend at an early age attitudes and techniques appropriate to a subsequent profession, they become part of one's developing personality.

The professional bias in education has another advantage in that it provides, when properly assimilated, a kind of control over a person's conduct. The expression "unprofessional conduct" has interesting implications. What we mean when we refer to unprofessional conduct is that a person is unfortunately not directed by the ideals and forms of behavior and the controls that promote the profession at its best. Another word often used in opposition to professional is "amateur." An amateur in this sense is someone who may do things very well but who is not completely absorbed in them and so his performance may fail occasionally—he may be sloppy, he may be indifferent, and so on. Good professional conduct means that a person will never willingly fail to perform in a manner that is consistent with the best interests of the calling he has undertaken. Another possible antonym to professional is "unscrupulous." The code of a profession is a kind of surrogate for character. The determination to be loyal to one's profession is sometimes what saves a person from himself.

However, life never gives us any gifts without some kind of codicil to the will. As we all know, the danger in early concentration on professional training is that sometimes such concentration can be the most narrowing of all educational experiences. This is a much more serious danger now than it was 150 to 200 years ago. Less was known; there were fewer things one had to learn to achieve mastery in a profession, and consequently there was time and incentive to educate oneself in other ways. But today, in complex professions like medicine or engineering or law, the very mass of information is overwhelming, and commitment to such a profession cannot be partial or casual. So committing ourselves to any professional course, though it does channel the great enthusiasm and genius for learning, can also be very narrowing. Similarly, the professional codes by which we operate can also become narrowing; instead of forming character, they become rigid rules of conduct.

Rigidity of professional conduct can occur in any walk of life in a person with

a high degree of integrity, a great devotion to duty, a passion to abide by the rules, and little imagination. This complex was admirably exemplified by a man who used to work many years ago in the buildings and grounds department of my university. The main faculty parking lot in those days was located at the lake, and you entered it by a narrow entrance that was guarded by a sentry box, occupied by a man named Axel, who saw to it that no car went in without the proper sticker. He was too old to do other, more active things, and he sat in the sentry box on cold winter days and on hot summer days, and when a car came up he would walk out, scrutinize the windshield, and if you had the right sticker he would let you in—and if you did not have it . . .

I remember once trying to enter the lot a few days after the beginning of the term without a new sticker. He stopped me. I kept saying, "Axel, you have known me for years." "An old sticker," he would reply. I finally said to him, "If you don't let me in, I am going to be late for class." And then he realized that it was not simply a case of a man trying to get by, but a challenge of one set of duties against another. He paused for a minute, and finally he said, "Tomorrow, have the new sticker," and he let me in.

Axel was capable, however, of manifesting the utmost pedantry in his professional conduct. One day a workman on the campus selected a very novel way of ending his life. He came roaring down Sheridan Road in his car and went through the narrow aperture of the parking lot at such a terrible speed that Axel hardly had time to get up and open the sentry-box door before the car was in, turned sharply to the right, and dove off the embankment and into the lake. It was a miserable failure. The car came to a stop upright in about two feet of water, with the driver still at the wheel, wet to the knees and merely shaken up. A little group of people gathered, and Axel pushed his way up to the front and looked very sharply at this car. As he turned and walked back to his sentry box, he was heard to mutter, "I am going to catch hell. He has got no sticker."

Axel seems to me to illustrate both the nobility and the limitations of professional codes of conduct. In the first instance he recognized the rival claims of two professional codes; in the second he took no account of the larger issues that sometimes interfere with the pedantic adherence to a code of professional ethics. All of us are familiar with celebrated instances from many professions in which an individual has been "read out of the party" only to be recognized as the hero of the day 15 or 20 years later. The narrowing that sometimes accompanies the professional channeling of education is thus duplicated in the narrowing that can occur when conduct is molded according to a prescribed set of laws for professional behavior. Both circumstances can encourage a short view of responsibility and advantage to society and produce a kind of limited priestcraft.

We can conclude that although it is in many ways a great advantage for students to have early familiarity with the tools and art of a profession, they sometimes—unless we are very careful—become frozen in mere technical expertness. What we are all worried about, no matter what our profession, is that today we are perhaps more beset than ever with the dangers of narrow, rigid, and simply conceived technicianship.

Perhaps for most people mere skill is the best we can expect. I think nature turns out just so many broad-gauged individuals, and we should perhaps be satis-

fied to have people who are competent and conscientious, even if narrowly trained. At least, they probably don't do a great deal of harm, and there are numerous situations in which they might do some good. Still, it is discouraging to conclude that we cannot do much better. And this thought leads me to another aspect of professional training that disturbs me, one that I see in my own profession of teaching. When I look over a campus, I sometimes wonder what has happened to some of those very bright men that were hired at the age of 28 and 30 with excellent preparation and good recommendations, and an energetic, breezy manner. They have gone stale at 45 and 50, and one is embarrassed to put students in their classes. Probably no profession is immune. As a matter of fact, I believe there was a study of the medical profession some years ago which illustrated that something of the sort can happen in medicine too.¹

Now, why does this happen? Is it simply a trick that nature plays on us, or is it something that we could have prevented if we had approached training for the profession in such a way as to instill something more in these people—a greater degree of flexibility, a greater encouragement of imagination, originality, and independence? Can we train for professional expertness and still provide for growth and expansion in the individual? Perhaps, if we could arrange a kind of built-in principle of growth and adaptation in the way in which professional education is imparted, we might have less of the kind of attrition—the loss of excellence, the loss of acuteness, the loss even of honesty—which often interferes with the best exercise of the profession during the middle and late years.

Approaches to the breadth vs. depth problem

What are the possibilities for approaching this problem with some hope of solution? There is always talk about getting greater breadth into education. Where do we find the opportunity to do this? Through what kind of arrangement of our educational process can we introduce breadth and at the same time not neglect the mastery of detail, the acuteness, the learning and skill required by the profession itself?

One way is to accelerate the acquisition of certain kinds of knowledge and skill in preparatory study, so that colleges could do more for the student than they now do in the period before he commits himself to his professional course. Such a reform is slowly taking place. In the meantime, most colleges have adopted some variation of the practice of devoting the first two years largely to what is popularly termed general education.

The pattern is a fairly common one. There are four main divisions of learning conventionally recognized, and a student is supposed to expose himself to each one of these in the first two years of his undergraduate work. As a palliative this is not a bad idea. It does, however, have certain disadvantages, and one of them—particularly in schools where this scheme is maintained with a great deal of rigidity, and where a student is allowed little or no choice at all—is that we lose the primary advantage of tremendous motivation to learn and to excel in some particular direction. To deprive the student who has just entered college of all oppor-

¹ Peterson, O. L. "An Analytical Study of North Carolina General Practice, 1953-1954," *J. Med. Educ.* 31, 1956, p. 5.

tunity to indulge his taste in something for which he has great zest and to compel him to channel all his enthusiasm in other directions may risk losing his enthusiasm altogether.

The fact that there is an "official" demand that students broaden themselves may have a deterring effect in securing the educational end we want; furthermore, what we provide may be too miscellaneous. Nevertheless, I expect that the present approach to the problem of educational breadth is better than the free-elective system of years ago, and is an improvement over confining a person to an intensive professional course from the minute he has turned 18. I am not sure, however, that we have found the best plan for the professional student in two respects: (1) the need to channel his individual enthusiasm properly and keep it alive while giving them breadth, and (2) the need to make our efforts at broadening him a direct means of enlarging the perspectives of his professional training and growth.

Perhaps one way of improving the situation is to establish a cumulative sort of academic experience, particularly in the general areas upon which the student's professional training is to be founded. That is to say, instead of having a pre-medical student take a number of miscellaneous courses, all of which may be in a general way appropriate to his future work as a physician, let us see if we cannot order the course work in such a way that science B takes advantage of the fact that the student has had science A, and science C takes advantage of the fact that he has had sciences A and B. And when the student enters upon his medical course, let us make sure that everything he has learned is taken advantage of.

In implementing such a plan, the method of instruction should not emphasize detailed information or manipulative expertness, but rather the general concepts that underlie the kind of learning possible within the given science. When the details of a science are coordinated with a growing perception of the principles on which it is founded and the kind of general conceptions it encourages, I think you are providing breadth as well as the kind of knowledge a profession requires. A great deal of breadth can be gained simply in terms of the way even a narrow specialty is approached. There is more than one way of teaching a person mathematics, for instance, or literature. The teacher can say to a student, in effect: "Solve these problems" or "Learn what this poem has to say about nature." On the other hand, the teacher can make the student aware that every problem he solves, every poem he reads, may represent an enlargement of our understanding of what mathematics is and can do, or of what the general function and nature of literature is.

Such shifts of emphasis in all basic teaching would be a great help, because even if the student did not familiarize himself with the knowledge available in every branch of learning, he would at least understand that no single fact, no single discipline, is an end in itself or stands alone. It was Bacon who said, "I have taken all knowledge to be my province," and we know today that in any literal sense this is madness. But in one sense it is an attainable ideal if we interpret it not as mastery of the entire range of all learning, but as understanding of the broad principles underlying any given form of knowledge and as comprehension of the kind of wisdom it can encourage.

In any professional program a certain amount of emphasis should be placed

on the contributions that can be made by various branches of learning other than those in which the student is primarily interested. We all know that experience by itself is meaningless except as it is given intellectual meaning by the categories we create for it. We can ask some kinds of questions in any science, and the answers in any given case provide their own special kind of insight and meaning. You find a certain world when you approach experience as a physicist, and you get a totally different world if you approach it as a poet, or as a sociologist. It is always the same world, but the categories into which you pour the fund of experience define reality in different ways. One important feature of any course of education is to help the student become aware of this—to help him reach an understanding of the sorts and ordering of reality that are possible in areas of learning other than those required by the profession which one has picked.

Conclusions

What are the advantages of this educational breadth—to the individual, the profession, and society at large? For the individual, this scope of philosophic understanding can contribute to the enrichment of life. In the exercise of one's profession, it provides a basis for insight beyond the limited learning, rules, and practices of one's craft and thus encourages exercise of the imagination. There is a kind of insight that is possible only when more than one area of knowledge and wisdom meet. Many discoveries in the history of human thought have occurred not only as a result of methodical analysis that led to the right conclusion, but through the illumination provided by analogy—one aspect of experience giving life to another, one kind of reality suggesting the possibility of new avenues in another. This experience is unlikely to occur to the single-minded person who in time comes to appreciate no aspect of reality except that provided by the ordering of fact and experience within the limited categories required by the practice of his art.

In a similar way exercise of the imagination has a way of freeing one from the more limiting pedantries of professionalism as a way of conduct. It is not always easy for a person to realize that he can be loyal to the highest ideals of his profession and at the same time want to change them under the pressure of changes without and within his profession. He can adapt himself only if he is sensitive to the environment created by society and the place within it of his own activities. Otherwise, he may not be able to realize that the welfare of his profession, and sometimes his own welfare, may require modifications in the most sacred codes of behavior, occasionally in even the most sacrosanct gestures of conduct. An appreciation of the multiple aspect of reality can be valuable because it keeps a person alive to all the conditions within which he must operate as a professional.

Philosophers have urged that the contemplation of truth is the highest good of man, and I suppose we must regard those men and women who have devoted themselves to this simple end as representatives of human nature at its best. It was Francis Bacon, however, who suggested that such an ideal is for God and the angels, and that for mankind there must be a more human orientation of our knowledge. People talk of escapist literature, referring thereby to reading that takes the mind off reality. Sometimes it seems to me that science can be the most

escapist of all human activities. It is so pure, and yet it is so magnificent a manifestation of human powers that we are unlikely to realize that the pursuit of science encourages isolation from the human scene. Although this isolation may be excusable for the pure scientist, it is not an advantage in professions like medicine that can ill afford a disregard of the human dimension. I hope for this reason that training in the professions might provide some place for those products of the human mind that are concerned with human beings as human beings, that offer insights into human experience which take into account the values men live by, the choices they are called upon to make, and the chances they must take for happiness or misery—in short, the humanities.

It must be acknowledged that there have been people who were narrowly trained and educated in old-fashioned ways who nevertheless broke from the limited bounds of their craft, showed imagination, and understood their relation to society and mankind. They are among the geniuses of the human race; they do not occur often. What we all want is that something of the spirit of these people shall be imbued into those competent, capable individuals who, if they could be developed to the full use of their powers, would attain largeness of stature and become ornaments to their profession. This is a particularly important objective today when the claims of professional education seem to be so pressing as to threaten this possibility.

Of the suggestions I have made in the course of this discussion, I would like to call attention to two by way of conclusion. They do not represent concrete proposals but general educational objectives. First, the teaching of every course, in any discipline, should be approached in such a way as to provide, beyond the information and its application, an understanding of the principles underlying the particular branch of learning and its relationship to the rest of knowledge. Second, during the course of his program of study, the professional student should be made aware of ways of organizing and interpreting information and experience other than those required by his professional study, so that he comes to appreciate the place of the learning and practice of his art in relation to the broadest concepts of science, the complex organization of society, and man himself.

CHAPTER 13

Physicians, Scientists, and Engineers

BY LEE A. DUBRIDGE

President, California Institute of Technology

Although the ailments of human beings and the ailments of machines and structures present quite different kinds of problems to the practitioner, engineers and physicians have similar functions in applying scientific principles and accumulated empirical knowledge toward the solution of problems and fulfillment of society's needs. During the past 30 years science and engineering educators have become convinced that educational programs should focus on developing student ability to understand and use basic science theory, leaving the practical arts and skills—aside from experience with a modest number of illustrative practical problems—to later apprenticeship training. Engineers, in contrast with physicians, are well paid during their apprenticeship period. A liberal education gives one a larger conception of the world in which he lives, and to this end mathematics and the physical and biological sciences are as important as the humanities and social sciences. Approach to a subject is more important than content in broadening intellectual powers and interests and extending the range of experience.

IT WOULD BE brash indeed of me, as a physicist and as head of a college of engineering, to attempt to present to a group of medical faculty members a discourse on medical education, because I know nothing about it. My discussion will be primarily of the education of physical scientists and engineers, and although the education of medical practitioners is quite a different problem, I hope you may find there are some useful similarities as well as instructive differences between the problems of educating the scientist or engineer and the problems of educating the physician. Please do not quote me, however, as suggesting that M.D.'s should be educated the same way as engineers, because I do not believe that. I do not even believe that engineers should be educated the way they are, and I hope to make that point clear shortly.

Before we start talking about education however, it is well to recognize that there are some similarities between the professions of engineering and medicine, as well as striking differences. Just as engineering is the art and practice of applying the principles of science—and a very substantial amount of empirical knowledge—to the fulfillment of human needs and wants, so medicine is the art of applying both science and empiricism to the treatment of human ailments and to the advancement of human health. The engineer practices the technology of the physical sciences, and the physician practices the technology of the biological and medical sciences. Neither type of technologist is interested in knowledge for its own sake, but rather in the application of knowledge to specific tasks, to meeting the problems of clients or patients.

Although physician and engineer share these similarities in function, they also

have vast differences. The ailments of human beings and the ailments of machines and structures present quite different kinds of problems to practitioners. Of course, the physician is not free of the necessity of dealing to some extent with instruments and machines, and the engineer must certainly deal quite a lot with human beings, but the focus of attention is very different, as are the attitudes involved—to say nothing of the penalties and rewards.

PRINCIPLES AND PRACTICES IN ENGINEERING EDUCATION

With the foregoing in mind, let me now set forth some principles and practices that are followed at Cal Tech and at other leading schools in the education of scientists and engineers. Since, to a large extent, we treat scientists and engineers in almost equivalent ways, I will not differentiate between them at the outset, although I will describe some differences later.

We have erected our educational program at Cal Tech on the basis of three premises:

1. That an extensive and intimate familiarity with basic science is the most essential asset a scientist or engineer can have.
2. That it is impossible to predict the special skills an individual will need, the interests he will have, or the ways in which science or technology will change in the next five, ten, or twenty years, and hence emphasis on current and therefore changeable practices should be at a minimum; familiarity with specialized principles and practices should be acquired primarily on the job rather than within the university.
3. That a scientist or engineer is also a human being and has human and social contacts and responsibilities. He should, therefore, have the opportunity to explore nonscientific fields in the hope that he may find something in them to help and inspire him. I must add parenthetically that this is sometimes a vain hope because the humanities and social sciences do not provide all the answers either.

The need for basic science

The physical sciences constitute an extensive body of empirical knowledge that is joined together through an immense and highly integrated structure of theory. Thus, to a large extent, the entire physical world can be understood and even predicted through the use of a relatively small and coherent system of physical principles or physical theories. Newton's laws of motion, Maxwell's electromagnetic theory, the principles of thermodynamics, the quantum theory, and the theory of relativity serve together to correlate an immense body of scientific knowledge that enables one to predict the behavior of nearly every imaginable physical system.

Mastery of these theories and their application to a host of problems and situations is not a simple undertaking. But it is a *finite* one—and it is a perfectly manageable program for a college and graduate school curriculum, provided a lot of irrelevant trivia are not allowed to intervene. It is the goal of scientific and engineering curricula to allow the student the opportunity to achieve this mastery of the principles of basic science up to the point, not where he has solved

every problem, but where he can recognize the basic elements of most problems and can attack them by bringing to bear the relevant theoretical techniques.

The key tool and the key language in all this is mathematics. Hence the education of a physical scientist must include many years of mathematical study. The exact statement of Newton's laws of motion can be expressed in a very simple mathematical equation ($F = ma$), but the application of this law to the millions of possible physical problems—anything from rolling marbles to spinning turbines or soaring rockets—requires an extensive collection of mathematical and analytical equipment whose mastery requires years of concentrated attention. The dividends of such study, however, are enormous. The proficient master of theoretical mechanics, for example, can bring into understandable and predictable form a vast and apparently bewildering array of physical phenomena. This is the reason for the extensive emphasis on basic science in engineering education.

As I have said, a college junior, or senior, or graduate student cannot possibly know when he chooses, say, mechanical engineering as a profession, whether in five or ten years he will be dealing with problems of missile nose cones, automobile engines, air-conditioning equipment, steam turbines, vibrating airplane wings, the design of bulldozers, or hundreds of other conceivable mechanical problems. Nor will he know in which way the company or agency for which he is then working will prefer to attack these problems. General Electric and Westinghouse do not attack the same problem in the same way, for example.

Therefore, in the educational process we have no choice except to give the student a comprehensive theoretical background of basic science, plus a little practical experience with a few problems selected as samples to illustrate how these basic principles are applied. An electrical engineer will need more familiarity with Maxwell's electromagnetic equations; the nuclear engineer will need to know thermodynamics and nuclear physics; the aerodynamicist will need the equations of fluid mechanics; the physicist will have to be familiar with the quantum theory, nuclear dynamics, the physics of solids; and so on. But all will need basic mathematics, physics, and chemistry as a foundation on which to build, and all who wish to proceed beyond the technician stage will need intimate familiarity with the basic theory in his chosen field.

One sometimes used to hear university curricula criticized as being "too theoretical" or "too academic" or "too impractical." But those who leveled such criticisms against the physical science curricula, at least, were only revealing their own ignorance. I would even say that the *only* thing the university can properly and adequately convey to a student is a theoretical understanding of his field, even though it must of course be attained in part through some experience in solving illustrative practical problems. To induce a student to memorize the solutions to thousands of problems rather than to apply the theory would literally be like trying to teach a parrot to talk, knowing full well that he has no understanding whatever of what he is saying and therefore can make no effective use of his loquacity. Let me repeat that the ability to understand and use theory is possibly the only useful and attainable goal of higher education in the physical and engineering sciences. The practical arts and skills, aside from a modest number of illustrative practice problems, must nearly all be acquired later.

This point of view was not widely accepted 30 years ago, and it is not universally accepted today. In 1929, for example, there were many companies who insisted that the new engineering graduates they employed be immediately useful in winding motors, repairing engines, or making radio sets. Such companies never dreamed in those days of hiring a physicist; they always complained that even the engineer was much too academic. But there has been a vast change. The physicist and chemist and mathematician have been found exceedingly useful and productive in proper industrial environments and, what is more, the theoretically trained engineer has been found to be a more solid, long-range investment than the nimble-fingered technician. The colleges have altered their courses accordingly; in fact the colleges have led this trend.

The acquisition of practical skills

Although the engineer must know his basic science and know it thoroughly, he must indeed know something more. Skill in applying basic principles does not follow automatically from an understanding of the principles alone. Any field of applied science requires also some aptitude and experience—possibly a great deal of experience—in the scientific arts and practices involved. It involves experience not only in applying basic principles but in recognizing the cases in which basic principles do not exist, and yet in which some solution to the problem must be found.

The question of how the budding young technologist, be he engineer or physician, is to acquire this experience with practical problems is, of course, the most baffling problem in all technical education. There are two extreme positions that are sometimes defended.

The first of these states that needed experience cannot be acquired at the university at all but must be acquired on the job. The other extreme is that to a very large degree this experience must be acquired in the university before any private practice at all is allowed. Actually, of course, some compromise between these extremes is nearly always followed. Some type of apprentice training is always required of both the engineer and the physician. The chief difference seems to be that the engineer—fresh from his Ph.D., let us say—gets well paid for his apprenticeship while the fledgling M.D. gets almost no pay at all during his four, five, or six years of apprentice training. This, I think, is thoroughly wrong and I wish it could be remedied at the earliest possible moment.

Thirty years ago engineers were almost universally regarded as adequately educated for their jobs after four years in an undergraduate course resulting in a bachelor's degree. But the insistent demand for men more thoroughly trained to attack the complex problems of modern industry and modern technology has led to an ever increasing demand for more graduate work, and the Ph.D. in engineering is now becoming very common.

Is this additional work toward the Ph.D. degree devoted to more of the "practical" courses? In general, no, not at all. Graduate engineering continues the emphasis on mathematics and basic science, while stressing the research point of view. The Ph.D. in civil engineering, for example, may well be no more clever than the B.S. in designing a bridge truss, but he will be much cleverer at evolving

wholly new principles of structure that may make the standard truss unnecessary or obsolete. The Ph.D. may not use an existing engineer's handbook any better, but he writes the new handbooks.

The contrast between the Ph.D. in engineering and the M.D.—even though both carry the title of “doctor”—is quite striking. The engineer with a Ph.D. is really ready to begin a career of applied research or of development and can go directly into a well-paid job or apprenticeship and begin productive research work. The M.D. is only prepared to begin his *training* for research, if he goes into that line, or for practice, if he goes in that direction. The M.D., of course, is not intended to be a research degree and is only intended to be a preparation for the apprenticeship.

The place of the “liberal arts”

I come now to the somewhat delicate matter that Dr. Moody E. Prior covered (see Chapter 12): the place of nonscientific subjects in the curriculum for the scientist or engineer. This problem is one on which there are differences of opinion, but there are differences of opinion on most of the things I have been talking about. The problem is often referred to as the place of the “liberal arts” in professional education. But to put it this way seems to me to beg the question completely because it implies that the liberal arts are something wholly outside of science and that science itself is not a liberal art. Nothing, I think, could be further from the truth.

The liberal arts are studies that free the mind, that liberalize the thoughts and give one a larger conception of the world in which he lives. To this end physics, mathematics, astronomy, chemistry, and biology may be just as effective instruments for freeing the mind as are art, literature, philosophy, history or government. The best liberal education is one that encompasses a balanced array of studies, including some of the humanities, some of the social sciences, and certainly some of the physical and biological sciences. If all students have had a solid introduction to each of these areas, then the one who goes on to further study in physics will have had no less a liberal education than the one who concentrates on history, philosophy, or literature. In fact, it seems to me that most majors in the humanities and social sciences are less liberally educated—because they have had little or no science—than most physicists, chemists, and engineers, all of whom have had at least some nonscientific studies.

Therefore, I conclude that the engineer with his bachelor of science degree or the premedical student with his bachelor of arts may both have had a liberal education, even with a major in a scientific field, if they have also had a reasonable opportunity to explore other fields. This opportunity, of course, is now provided by all first-class colleges of engineering and first-class colleges that teach premedical studies. All offer the opportunity, and indeed all insist that nonscientific fields be explored. This may not have been the case 30 years ago, but in engineering colleges of today it clearly is.

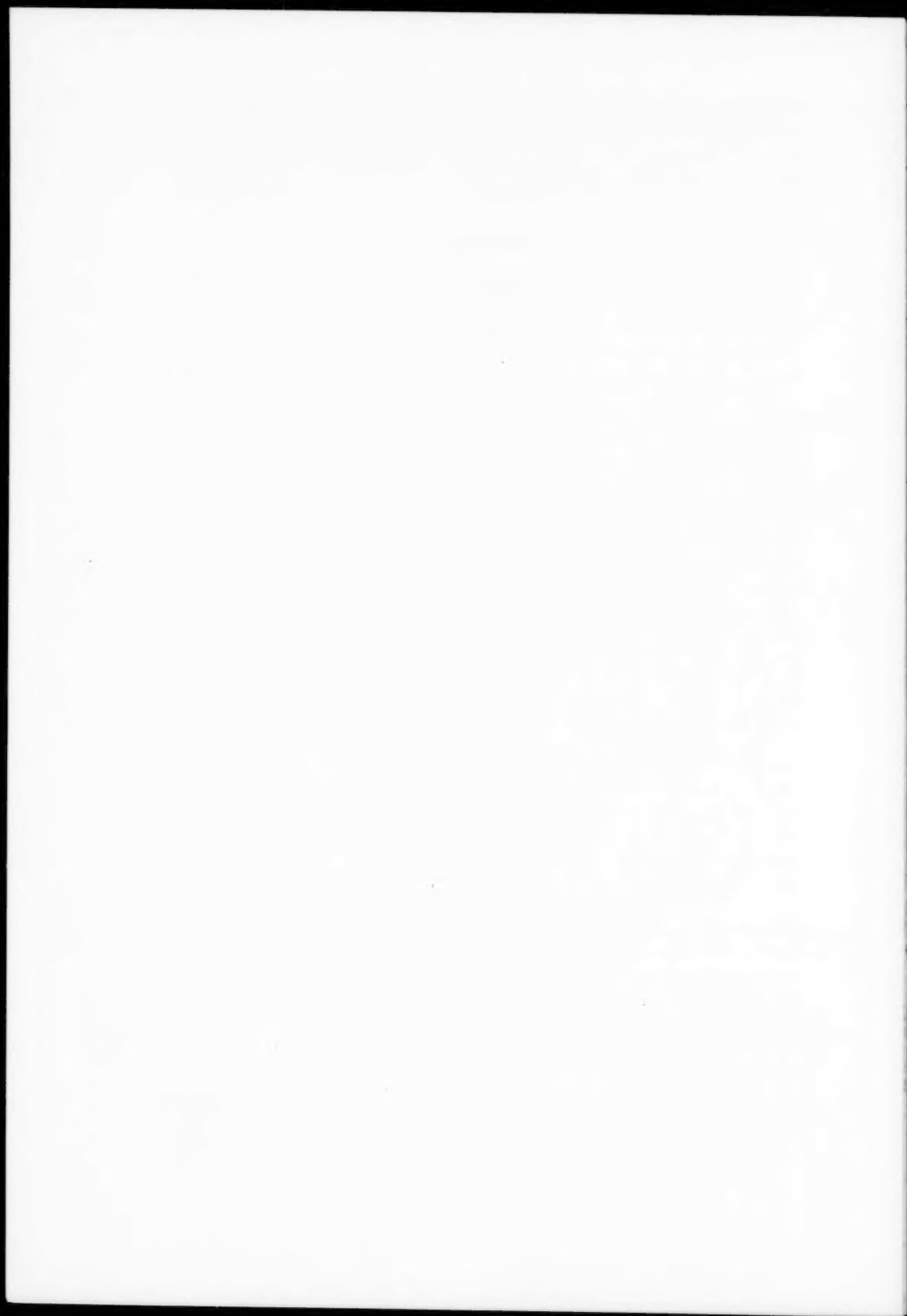
Incidentally, referring to Dean Prior's point about the introduction of a general education as a preliminary to a professional education, we believe at Cal Tech that the nonscientific studies—I am not going to call them liberal arts—

should not take place solely in the first two years but should be a part of the entire four-year course. A student is continually exploring fields outside of his specialty throughout his four, or even five or more years, if he goes on to a master's degree. We do not assume that one can acquire a liberal education in two years and then forget it and go on to a professional or a technical education.

CONCLUSION

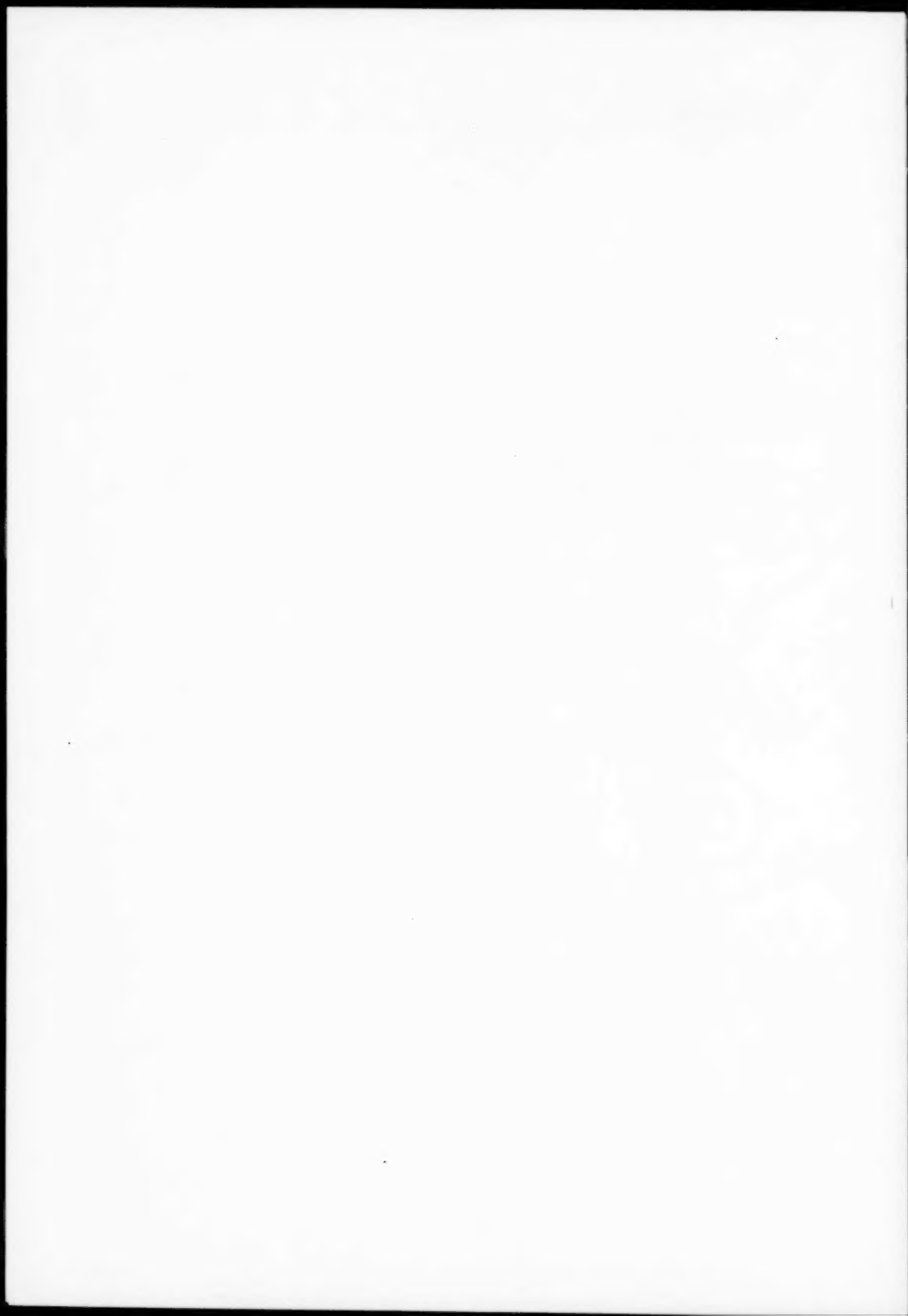
In conclusion, I would repeat that the main task of professional education—certainly in engineering—is to give a student the opportunity of learning the principles and practices of his profession and to stimulate his intellectual curiosity so he may have fruitful and satisfying experiences in exploring other fields of human endeavor. The more broadly and actively a mind ranges, the better mind it is likely to be—or likely to become. But, I should add, pondering on Shelley's poetry or on Dante's "Inferno" is in itself no more—and may be less—humanizing than pondering on the expanding universe, the evolution of life, or the nature of disease.

A liberal education, then, depends upon the approach to the subject rather than the content, and as a part and as a philosophy of a professional education its purpose is to give a man the means to broaden his intellectual powers and interests, and to extend the range of his experience. Whether this will make him a more or less valuable citizen, or a more or less effective professional, I do not think anyone has proved either way. But it is still only fair and proper to provide every student with the opportunity—giving him a little push if necessary—to have a broad base on which to erect his deeper and more specialized studies.



APPENDIXES

	PAGE
A. Organization of the 1959 Institute	183
B. Roster of Participants	186
C. Background Information for Chapter 3 and Chapter 11	
1. <i>Tests for Bias</i>	193
2. <i>Questionnaire for Interns</i>	196
3. <i>Questionnaire for Physicians</i>	198



APPENDIX A

Organization of the 1959 Institute

The Second Institute on Clinical Teaching, reported in the present volume, was held in 1959 at Chicago, Illinois. It followed the First Institute on Clinical Teaching, held in 1958 at Swampscott, Massachusetts,¹ and was seventh in the annual series of AAMC Teaching Institutes. As described by Dr. Thomas H. Hunter in the Preface, this 1959 Institute has marked the culmination of one phase in Institute history.

In 1958, Institute participants considered the objectives and the setting of clinical teaching; the interrelations among students, patients, and teachers; and the impact of extramural forces. Building upon the foundation laid by that Institute, the Planning Committee for 1959 and its three subcommittees geared their program preparation to consideration of medical school curricula, the internship, the roles of the university and the examining boards, and the physician-patient relationship. Some analysis of factors in the pre-Institute deliberations is given, along with commentary on Institute outcomes, by Dr. Charles G. Child, III, in the Introduction to this volume.

Topic I—Medical School Curricula: An Operation on Clinical Teaching

This part of the Institute program is reproduced, with minor variations in sequence, in Part I of this book. Dr. J. Englebert Dunphy, subcommittee chairman, introduced the four speakers who discussed the paradoxical curricular plight of the basic medical sciences, the idols luring students away from teaching and research careers, the implications of difficulties encountered by specialists in their residency training, and the opportunities for the university to assume more responsibility for education at internship level. Dr. Dunphy himself presented his subcommittee's proposal for keeping the first two years of medical school as the particular province of the basic sciences and accomplishing integration by bringing sciences into the clinical years. Both a basic scientist and a clinician were invited to comment on their reactions to the proposed curricular operation.

An important contribution to Topic I activity at the Institute was made by a pre-Institute survey (see Appendix C) of 1958–59 interns and a reanalysis of previous data obtained from medical faculty members. This material was compiled in workbook form² for the Institute participants. Chapter 3 of the present volume describes the 1958–59 interns and the types of internship served

¹ Proceedings of the sixth AAMC Teaching Institute are reported in Gee, Helen Hofer, and Richmond, Julius B. (eds.), *Report of the First Institute on Clinical Teaching* (Evanston, Illinois: Association of American Medical Colleges, 1959).

² *The 1959 Teaching Institute Workbook: A Report of Special Studies and Questionnaire Analyses* (Evanston, Illinois: Association of American Medical Colleges, 1959).

and gives fact and opinion on internship choice. It also reports faculty views on the desirability of different types of internship, as well as on incorporating the internship into the fourth year of the medical curriculum.

Topic II—The Roles of the University and Examining Boards in the Education of Medical Students, Interns, and Residents

Part II of this book coincides with the Institute's Topic II, which was planned by the subcommittee under the chairmanship of Dr. Eugene A. Stead, Jr. There was a close transition from the examination of curricular timing discussed on the first day of the Institute. Dr. Stead spoke for the fourth year as a time for contemplative review of basic sciences—a year for synthesis with the clinical work learned in the third year. He definitely opposed proposals that the internship be integrated with the fourth year.

The four speakers that followed concentrated on the postgraduate student and the positive and negative influences on his educational development resulting from the roles played by the National Board of Medical Examiners and the specialty boards. Throughout the program for Topic II, as with Topic I, attention was given to the influence of the university and the problem of fostering the academically oriented development of students showing talent for careers in teaching and research.

Topic III—Science and Art in Teaching Responsibility for Patients

Chapters 8 through 10 reproduce the papers presented on that part of the Institute program devoted to Topic III. Dr. Herbert S. Gaskill, who served as chairman of this subcommittee, spoke on the importance to the practitioner of understanding psychological aspects in the interrelationship of physician and patient. A panel of five medical faculty members carried on the discussion with commentary on the need for teaching what is known of the science and art of manipulating psychological factors in the physician-patient relationship. Further light on this subject emerged from another pre-Institute survey reproduced from the participants' workbook. Chapter 11 reports the opinions of physicians (M.D. 1950) on their own education, and the results indicate that formal teaching played a generally minor role in their understanding of physician-patient psychology.

Dr. Gaskill also emphasized the responsibility of psychiatrists to communicate their knowledge. One speaker presented a very comprehensive paper clarifying the status of dynamic psychiatry and psychology as sciences and citing the need for medical students to understand the distinctions among knowledge, conviction, and ignorance in this field.

Extramural Contributors to the Institute

The two final chapters, constituting Part IV of this book, were presented on the evening of the second day at the Institute, following an Institute tradition of inviting special guest speakers from fields other than medicine. Moody E. Prior, professor of English and dean of the graduate school at Northwestern

University, and Lee A. DuBridge, president of California Institute of Technology, spoke on the broader aspects of graduate education. Though quite different, both papers pleaded for the most effective teaching of understanding of basic concepts in any field and both stressed a breadth of education wherein other branches of learning can contribute intellectually to the developing professional student. Throughout the Institute there was some awareness of the analogous problems facing educators in all fields as well as the difficulties peculiar to medical education.

As with previous Institutes, there were some other guests from fields outside of medicine who joined with participants from the medical schools in the general sessions and the small-group discussions. The complete roster of participants is given in Appendix B. These people—all the participants—were the most important factors in the success of the 1959 Institute, a circumstance that has characterized every AAMC Teaching Institute to date.

APPENDIX B

Roster of Participants—1959 Institute

- ALDRICH, C. KNIGHT, M.D., *Professor of Psychiatry and Chairman of the Department*, University of Chicago School of Medicine
- ALDRICH, ROBERT A., M.D., *Professor of Pediatrics and Executive Officer of the Department*, University of Washington School of Medicine
- ALLEN, MAX S., M.D., *Professor of Medicine*, University of Kansas School of Medicine
- ALTEMEIER, WILLIAM A., M.D., *Christian R. Holmes Professor of Surgery and Chairman of the Department*, University of Cincinnati College of Medicine
- ARTUSIO, JOSEPH F., JR., M.D., *Professor of Anesthesiology in Surgery*, Cornell University Medical College
- BARCHILON, JOSÉ, M.D., *Associate Professor of Psychiatry and Director of Education*, Albert Einstein College of Medicine of Yeshiva University
- BARNETT, HENRY L., M.D., *Professor of Pediatrics and Chairman of the Department*, Albert Einstein College of Medicine of Yeshiva University
- BEECHER, HENRY K., M.D., *Henry Isaiah Dorr Professor of Research in Anesthesia*, Harvard Medical School
- BELL, LENNOX G., M.D., *Dean and Professor of Medicine and Chairman of the Department*, University of Manitoba Faculty of Medicine
- BENJAMIN, JOHN D., M.D., *Professor of Psychiatry*, University of Colorado School of Medicine
- BERG, ROBERT L., M.D., *Albert D. Kaiser Professor of Preventive Medicine and Chairman of the Department, and Associate Professor of Medicine*, University of Rochester School of Medicine and Dentistry
- BERRY, GEORGE PACKER, M.D., *Dean and Professor of Bacteriology*, Harvard Medical School
- BERRYHILL, WALTER R., M.D., *Dean and Professor of Medicine*, University of North Carolina School of Medicine
- BERSON, ROBERT C., M.D., *Vice-President for Health Affairs, Dean, and Professor of Medicine*, Medical College of Alabama
- BINGHAM, D. L. C., M.B., Ch.B., *Professor of Surgery*, Queen's University Faculty of Medicine
- BLAND, JOHN H., M.D., *Associate Professor of Clinical Medicine*, University of Vermont College of Medicine
- BOUCOT, KATHARINE R., M.D., *Professor of Preventive Medicine and Clinical Professor of Medicine*, Woman's Medical College of Pennsylvania
- BROWN, ROBERT L., M.D., *Assistant Dean*, University of Buffalo School of Medicine
- BUCHER, ROBERT M., M.D., *Dean and Assistant Professor of Surgery*, Temple University School of Medicine
- BURDETTE, WALTER J., M.D., Ph.D., *Professor of Surgery and Head of the Department*, University of Utah College of Medicine

- CAMPBELL, JAMES A., M.D., *Professor of Medicine*, University of Illinois College of Medicine
- CAUGHEY, JOHN L., JR., M.D., *Associate Dean and Associate Professor of Clinical Medicine*, Western Reserve University School of Medicine
- CHAGLIASSIAN, HRANT T., M.D., *Professor of Dermatology and Syphilology*, American University of Beirut School of Medicine
- CHILD, CHARLES G., III, M.D., *Professor of Surgery and Chairman of the Department*, University of Michigan Medical School
- CLUFF, LEIGHTON E., M.D., *Associate Professor of Medicine*, Johns Hopkins University School of Medicine
- COGGESHALL, LOWELL T., M.D., *Dean of the Division of Biological Sciences and Professor of Medicine*, University of Chicago School of Medicine
- COLLIER, CLARENCE R., M.D., *Associate Professor of Physiology*, College of Medical Evangelists School of Medicine
- CONWAY, DOMINICK J., M.D., *Professor of Paediatrics and Head of the Department*, University of Ottawa Faculty of Medicine
- COPE, OLIVER, M.D., *Associate Professor of Surgery*, Harvard Medical School
- COWLES, JOHN T., Ph.D., *Professor of Psychology and Director of Educational Planning for the Schools of the Health Professions*, University of Pittsburgh
- CRISPELL, KENNETH R., M.D., *Professor of Medicine and Director of the Department*, New York Medical College
- CULBERTSON, JAMES W., M.D., *Professor of Medicine*, University of Tennessee College of Medicine
- DARLEY, JOHN G., Ph.D., *Executive Secretary*, American Psychological Association, and *Professor of Psychology (on leave of absence)*, University of Minnesota; formerly *Associate Dean of the Graduate School*, University of Minnesota
- DARLEY, WARD, M.D., *Executive Director*, Association of American Medical Colleges
- DAY, RICHARD L., M.D., *Professor of Pediatrics and Chairman of the Department*, State University of New York, Downstate Medical Center
- DEITRICK, JOHN E., M.D., *Dean and Professor of Medicine*, Cornell University Medical College
- DUBRIDGE, LEE A., Ph.D., *President*, California Institute of Technology
- DUFRESNE, ROGER R., M.D., *Assistant Dean and Professor of Medicine*, University of Montreal Faculty of Medicine
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APPENDIX C

Tests for Bias

Intern sample

The representativeness of the sample of interns used in the analyses is demonstrated in Tables C.1-C.3. The group against which the sample is compared is the 50 per cent straight random sample of 1958-59 interns to whom questionnaires were sent, on the assumption that this 50 per cent random sample is representative of the entire 1958-59 intern population.

Three bases for comparison of the interns who did and did not return com-

TABLE C.1
MCAT LEVELS OF INTERN RESPONDENTS
AND NONRESPONDENTS

Level ($\frac{VA+QA}{2}$)	Respondent group		Non-respondents		Total	
	N	%	N	%	N	%
High (580 or higher)	603	23	111	21	714	23
Middle (470-579)	1303	50	252	49	1555	50
Low (below 470)	598	23	131	25	729	23
No MCAT	112	4	25	5	137	4
Total	2616	100	519	100	3135	100
$\chi^2=2.003 \quad p > .20$						

TABLE C.2
COMPARISON OF INTERN RESPONDENTS AND NON-RESPONDENTS ON TEACHING AFFILIATION OF HOSPITAL

Affiliation	Respondent group		Non-respondents		Total	
	N	%	N	%	N	%
Major	1325	50	284	55	1609	51
Minor	174	7	38	7	212	7
None	1117	43	197	38	1314	42
Total	2616	100	519	100	3135	100
$\chi^2=4.0084 \quad p > .10$						

TABLE C.3
COMPARISON OF INTERN RESPONDENTS AND NON-RESPONDENTS ON EXPENDITURE LEVEL OF MEDICAL SCHOOL ATTENDED

Expenditure level	Respondent group		Non-respondents		Total	
	N	%	N	%	N	%
High	973	37	190	37	1163	37
Middle	1085	42	212	41	1297	41
Low	558	21	117	22	675	22
Total	2616	100	519	100	3135	100
$\chi^2=.3768 \quad p > .80$						

TABLE C.4
AGES OF PHYSICIAN RESPONDENTS
AND NONRESPONDENTS

Age group	Respondent sample		Non-respondents		Total sample	
	N	%	N	%	N	%
Over 43	104	5	66	10	170	7
37-43	885	45	305	48	1190	46
Under 37	964	50	270	42	1234	47
Total	1953	100	641	100	2594	100

$\chi^2 = 24.3068 \quad p > .01$

TABLE C.5
PRESENT PRACTICE OF PHYSICIAN RESPONDENTS
AND NONRESPONDENTS

Type of practice*	Respondent sample		Non-respondents		Total sample	
	N	%	N	%	N	%
General practice	634	32	254	40	888	34
Full-time specialty practice	707	36	183	29	890	34
Part-time specialty practice	152	8	45	7	197	8
Resident	97	5	53	8	150	6
Other full-time hospital service	257	13	66	10	323	12
Full-time medical school	42	2	9	1	51	2
Medical administration	4	†	1	†	5	†
Research	14	1	5	1	19	1
Non-federal public health, dental, or industrial	30	2	9	1	39	2
Not in practice	16	1	16	3	32	1
Total	1953	100	641	100	2594	100

$\chi^2 = 29.7013 \quad p < .01$ (In computing this χ^2 , the last five categories were combined.)

* Type of practice records which were available for both respondents and nonrespondents were contained in AMA files. These records do not correspond exactly with type of practice categories used in subsequent analyses.

† Less than .05 per cent.

pleted questionnaires were used: level of intellectual ability as measured by the Medical College Admission Test (MCAT) Verbal and Quantitative scores; the affiliative relation to medical schools of the hospitals at which they are interning; and the type of medical school from which the students graduated as measured by total budgetary expenditure of the schools for 1957-58.

None of the very slight differences in distributions of percentages is statistically significant, as is indicated by the χ^2 's shown at the foot of each table. Thus, in terms of the broad scope of experience through medical school and internship and in terms of intellectual capacity, we are assured that our responding interns are truly representative of the population of 1958 interns.

Physician sample

Tables C.4-C.6 describe the sample of physicians who graduated from medical school in 1950. Again, we may assume that the 50 per cent straight random sample that was drawn contained no biases, and that differences between physicians who did and did not return their questionnaires indicate bias grounded in respondents' attitudes.

As the χ^2 's indicate, the responding physician sample is somewhat biased. Since this group entered medical school in 1946, before the present form of

TABLE C.6
SPECIALTY BOARD CERTIFICATION OF PHYSICIAN
RESPONDENTS AND NONRESPONDENTS

Certification	Respondent sample		Non-respondents		Total sample	
	N	%	N	%	N	%
Certified	519	27	123	19	642	25
Not certified	1434	73	518	81	1952	75
Total	1953	100	641	100	2594	100
$\chi^2=14.1349 \quad p < .01$						

the MCAT was developed, no direct measure of intellectual capacity has been utilized. However, other studies¹ have shown that in any given medical school class, ability is correlated negatively with age and bears a direct relation to the type of career planned in a hierarchy in which mean scores run from low to high for general practitioners, specialty practitioners, and teaching and research personnel. The physicians who returned their questionnaires are younger than their reluctant nonresponding peers. They have, by and large, achieved higher status in the profession, as shown by the facts that only 32 per cent are in general practice as compared with 40 per cent of the nonrespondents; that 36 per cent are in specialty practice as compared with 29 per cent of nonrespondents; and that 27 per cent are certified as compared with 19 per cent of nonrespondents. Notably, three per cent of the nonrespondents have been lost to the profession (not in practice) as compared with one per cent of the respondents.

With samples as large as these, slight differences in distributions are significant. Practically speaking, there are adequate numbers of representatives of each age group and type of career to permit development of their points of view. Where questionnaire responses show a correlation with age and level of practice, however, the differences between groups will be underestimated. This report, then, will lack full representation of the viewpoints of older, less successful, and probably less able general practitioners.

¹ Klinger, Eric, and Gee, Helen Hofer, "The Study of Applicants, 1958-59," *J. Med. Educ.* 35, 1960, pp. 120-33.

QUESTIONNAIRE FOR INTERNS

I. What type of internship are you serving? (check one)

- ☐ 1. Rotating General
- ☐ 2. Mixed
- ☐ 3. Straight Medical
- ☐ 4. Straight Pediatric
- ☐ 5. Other (specify) _____

II. What field of medicine do you ultimately plan to enter? (check one)

- ☐ 1. General Practice
- ☐ 2. Specialty Practice
- ☐ 3. Teaching and/or Research
- ☐ 4. Combination of Specialty Practice, Teaching and/or Research
- ☐ 5. Other (specify) _____

III. Following your internship, how many more years of formal education do you plan to invest in your preparation for a professional career? Enter the number of years you plan to spend in each category.

- ☐ Residency and/or Clinical Fellowship
- ☐ Research Fellowship
- ☐ Graduate School Course Work
- ☐ Other (specify) _____
- ☐ Total number of years

IV. Are medical students serving clinical clerkships in the hospital where you are interning?

- ☐ 1. Yes
- ☐ 2. No

If yes, do you feel that their presence has contributed to or detracted from your educational experiences as an intern?

- ☐ 1. Contributed
- ☐ 2. Detracted
- ☐ 3. No Effect

V. Check in the appropriate columns your opinion of the educational value of each of your clinical clerkships in medical school.

VALUE	CLERKSHIPS				
	Medicine	Ob/Gyn	Pediatrics	Psychiatry	Surgery
Excellent	1. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good	2. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fair	3. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor	4. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VI. To what extent has your internship been a valuable educational experience beyond your clinical clerkships in medical school? (check one)

- ☐ 1. Much
- ☐ 2. Some
- ☐ 3. Little
- ☐ 4. None

VII. How has the internship contributed to your professional development?
(check all applicable) *By providing:*

- _____ 1. increased responsibility for patients
- _____ 2. increased number of patients
- _____ 3. broader experience with varieties of disease
- _____ 4. increased opportunity to acquire technical skills
- _____ 5. more instruction in the application of scientific knowledge to patient care
- _____ 6. constructive review and criticism of your work with individual patients
- _____ 7. Other (specify) _____

VIII. How has your internship failed to contribute to your professional education? (check all applicable) *By failing to provide:*

- _____ 1. sufficient responsibility for patient care
- _____ 2. an adequate number of patients
- _____ 3. sufficient opportunity to treat patients adequately (too many patients)
- _____ 4. sufficient experience with varieties of disease
- _____ 5. a sufficient opportunity to acquire technical skills
- _____ 6. adequate instruction in the application of scientific knowledge to patient care
- _____ 7. sufficient review and criticism of your work with individual patients
- _____ 8. educational experiences that were more than mere duplications of clerkship experiences
- _____ 9. Other (specify) _____

IX. In the light of your experiences as an intern, were your clerkships in medical school: (check one)

- _____ 1. too theoretical
- _____ 2. too practical
- _____ 3. well balanced between theory and practice

X. Has your internship been: (check one)

- _____ 1. too theoretical
- _____ 2. too practical
- _____ 3. well balanced between theoretical and practical experiences

XI. If there are additional aspects of clerkships and internships about which you would like to comment, please do so below.

Clerkships: _____

Internships: _____

QUESTIONNAIRE FOR PHYSICIANS

I. Where did you serve your internship?

Hospital	City	State
----------	------	-------

II. How much graduate education (subsequent to obtaining the M.D. degree) have you had? Indicate the number of years in each category.

	Years
Internship, approved residency, and/or clinical fellowship	_____
Research fellowship	_____
Graduate school course work	_____
Other (specify)	_____
Total number of years	_____

III. In what type of medical career are you now engaged? (check one)

General practice	_____ 1
Specialty practice	_____ 2
Teaching and/or research	_____ 3
Combination of specialty practice, teaching and/or research	_____ 4
Other (specify)	_____ 5

IV. Which of the following contributed *most* to the development of your understanding of and skill in dealing with the doctor-patient relationship? (check one in each column)

	During medical school	Subsequent to medical school
Observing the way in which instructors dealt with the doctor-patient relationship	_____ 1.	_____
Formal instruction in methods of dealing with the doctor- patient relationship	_____ 2.	_____
Trial and error on your own	_____ 3.	_____
Other (describe)	_____ 4.	_____

V. Please evaluate your opportunities to learn how to establish good doctor-patient relationships during each of the training periods listed below. (check one for each period)

Instruction in dealing with doctor-patient relationships	Medical school	PERIOD Internship	Residency or fellowship
Excellent	1. _____	_____	_____
Good	2. _____	_____	_____
Fair	3. _____	_____	_____
Poor	4. _____	_____	_____

VI. In the light of subsequent experience one always sees deficiencies in his formal educational experiences in medical school. In which of the following areas do you feel your medical school experience was *most* deficient? (check one)

Basic medical sciences	_____ 1
Application of basic medical sciences to clinical problems	_____ 2
Practical clinical experience	_____ 3
Practical instruction in the doctor-patient relationship	_____ 4

VII. Realizing the amount of time available in the medical school curriculum is finite, and that additional educational experience is available during the internship and residency, and that self education continues indefinitely, is it your opinion that any of the following should have received greater emphasis during your medical school years? (check all applicable)

Techniques of managing minor psychiatric disorders	1
Legal medicine	2
Community health resources	3
Economics of medical practice	4
Medical ethics	5
Other (specify)	6

VIII. Any comments you may wish to make about your medical school experience are welcome.



